ISSUE 192 SEPTEMBER 2009

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Meet Norm!

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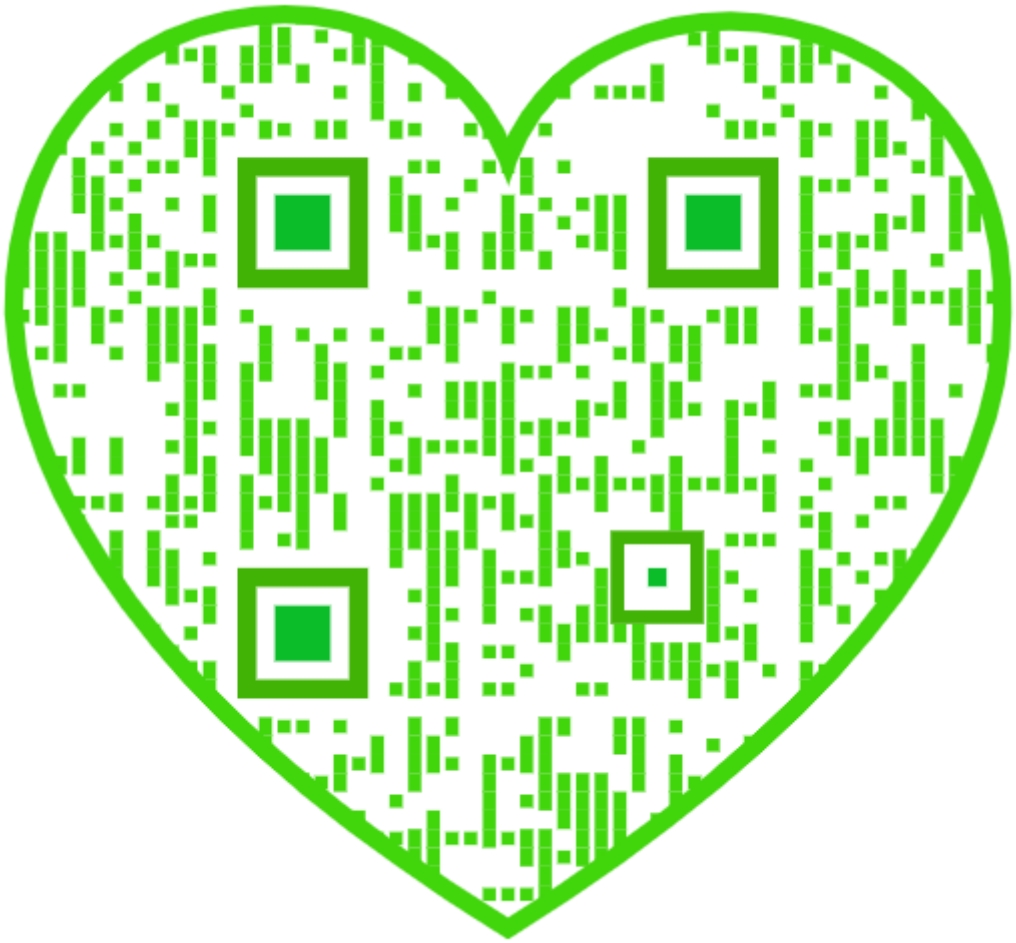

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- Precision ground cast iron table
- Table size: 20 1/2" x 14"
- Table tilt: 45° R, 10° L
- Cutting capacity/throat: 13 1/2"
- Max. cutting height: 6"
- Blade size: 92 1/2" to 93 1/2" (1/8" - 3/4" W)
- Cast iron wheels
- Approx. shipping weight: 262 lbs.

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- Precision ground cast iron table
- Table size: 19 3/4" x 14 3/16"
- Table tilt: 45° R, 8° L
- Cutting capacity/throat: 13 1/2"
- Max. cutting height: 10"
- Blade size: 106" L (1/8" - 3/4" W)
- Blade speed: 3000 FPM
- 6" re-saw fence
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- Max. cutting height: 12"
- Blade size: 143" L (1/8" - 1 1/4" wide)
- 2 Blade speeds: 1700, 3500 FPM
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- Motor: 3 HP, 220V, single-phase
- Precision ground cast iron tables & extension wings
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- Max. cutting height: 8"
- Feed rate: 16 & 30 FPM
- Cutterhead speed: 5000 RPM
- Built-in mobile base
- Magnetic safety switch
- Heavy-duty cast iron construction
- Approx. shipping weight: 675 lbs.

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G0453
3 Blade Cutterhead ONLY $950.00

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G0453Z Z SERIES
Spiral Cutterhead ONLY $1495.00

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Spiral Cutterhead

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PATENT PENDING DIGITAL READOUT

EXTREME SERIES

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- Motor: 3 HP, 220V, single-phase, TEFC
- Precision ground cast iron tables
- Total table size: 8" x 76⅜"
- Infeed table size: 8" x 43⅜"
- 4 row spiral cutterhead
- Cutterhead speed: 5350 RPM
- Max. rabbeting depth: ½"
- Deluxe cast iron fence size: 35"L x 1¼"W x 5"H
- Approx. shipping weight: 597 lbs.

INCLUDES FREE SAFETY PUSH BLOCKS

EXTRA LONG INFEED TABLE & EXTRA TALL FENCE WITH RACK & PINION ADJUSTMENT

G0495X ONLY $1795.00

FREE SHIPPING

13" Planer *w/Dust Collection*

- Motor: 2 HP, 110V, single-phase
- Max. cutting width: 13"
- Max. cutting height: 6"
- Max. cutting depth: 1/16"
- Cutterhead speed: 8000 RPM
- Feed rate: 19 FPM
- Knives: 2 double-edged HSS
- Approx. shipping weight: 95 lbs.

New!

INCLUDES 2½" DUST PORT & COLLECTION BAG, SIDE HANDLES & FLIP UP WINGS FOR PORTABILITY!

G0689
INTRODUCTORY PRICE $375.00

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6" Parallelogram Jointers

- Motor: 1½ HP, 110V/220V, single-phase
- Precision ground cast iron tables size: 6" x 55½"
- Rabbeting capacity: ½" • Max. depth of cut: ⅛"
- Cutterhead speed: 4850 RPM
- Parallelogram table adjustment
- Center mounted fence
- Built-in mobile base
- Approx. shipping weight: 362 lbs.

FREE SHIPPING

INCLUDES FREE SAFETY PUSH BLOCKS

G0604X
4 KNIFE CUTTERHEAD
ONLY $650.00

G0604ZX
SPIRAL CUTTERHEAD
ONLY $895.00

8" Jointers *w/Built-in Mobile Base*

- Motor: 3 HP, 220V, single-phase, TEFC, 3450 RPM
- Precision ground cast iron tables size: 9" x 72½"
- Rabbeting capacity: ½" • Max. depth of cut: ⅛"
- Cutterhead speed: 5000 RPM
- Deluxe cast iron fence size: 35" L x 5" H
- Built-in mobile base
- Approx. shipping weight: 552 lbs.

INCLUDES FREE SAFETY PUSH BLOCKS

G0656 ~~$795.00~~
SALE $750.00

G0656X
ONLY $1095.00

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12" Baby Drum Sander

- Sanding motor: 1½ HP, 110V, single-phase
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- Drum surface speed: 2300 FPM
- Max. stock dimensions: 12" wide x 3½" thick
- Min. stock length: 8"
- Sanding drum size: 4"
- Sanding belt: 3" hook & loop
- Approx. shipping weight: 160 lbs.

SIDE HANDLES FOR PORTABILITY!

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G0459
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- Motor: 3 HP, 220V, single-phase w/reversing switch
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- Table w/standard wing attached: 30½" x 20¼"
- 3 interchangeable spindles: ½", ¾" & 1"
- Spindle travel: 3"
- Spindle speeds: 7000 & 10,000 RPM
- Spindle openings on table: 1⅜", 2¾", 4" & 5½"
- Approx. shipping weight: 357 lbs.

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ONLY $925.00

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1½ HP Cyclone Dust Collector

- Motor: 1½ HP, 110V/220V, single-phase, TEFC Class "F", 60 Hertz/3450 RPM
- Intake hole size: 6"
- Impeller: 12½" steel
- Suction capacity: 1025 CFM @ 2.6 SP
- Max. static pressure (in. of water): 10.3"
- Filter: .02-2 microns (99% efficiency)
- Filter surface area: 96 sq. ft.
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- Approx. shipping weight: 313 lbs.

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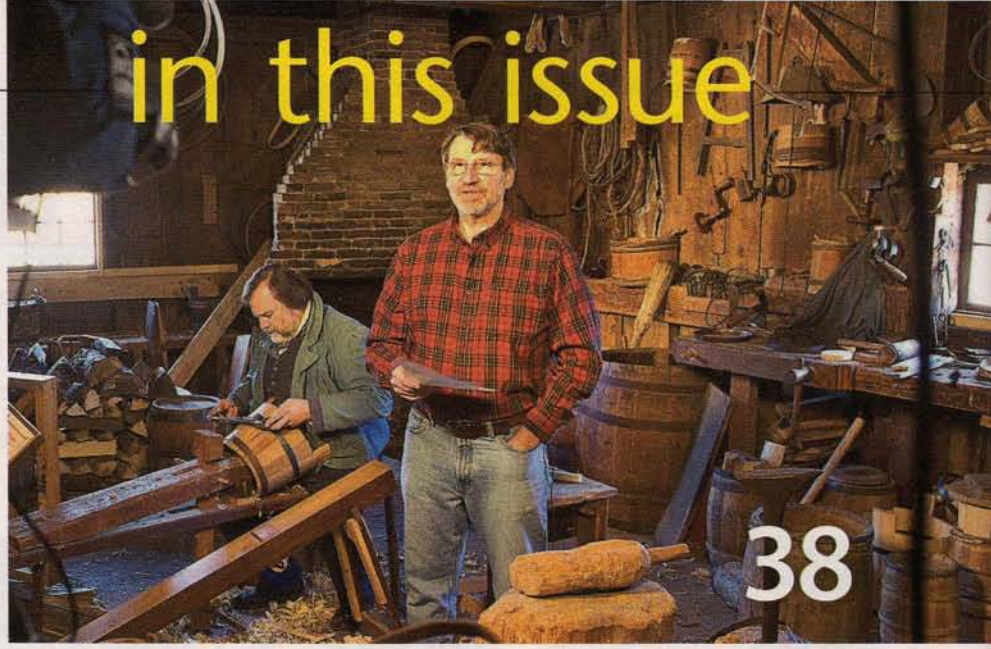

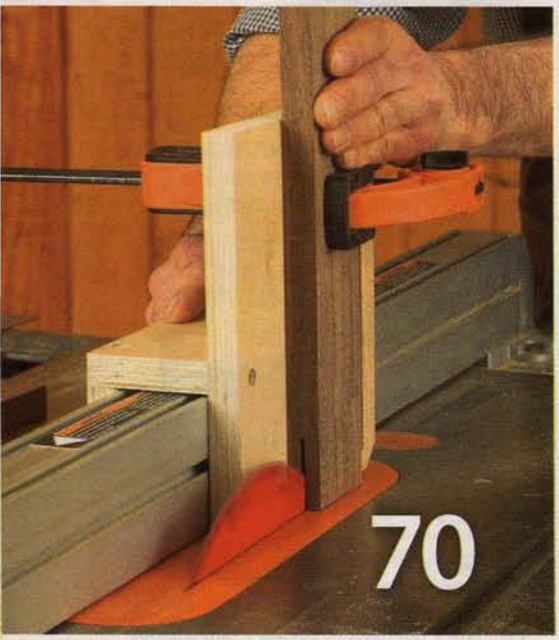

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This seal is your assurance that we build every project, verify every fact, and test every reviewed tool in our workshop to guarantee your success and complete satisfaction.

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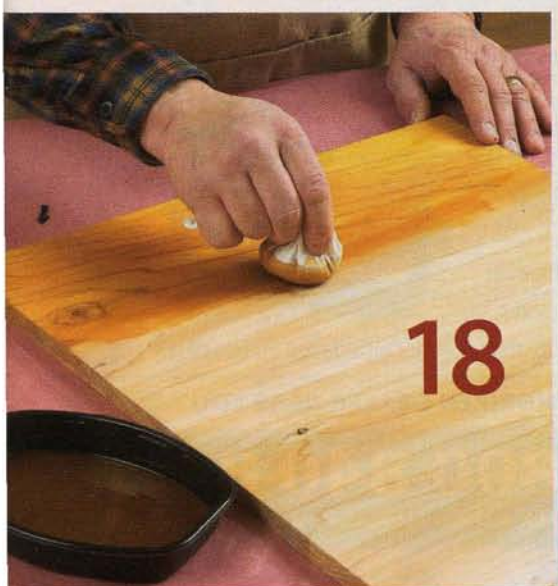

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on the web

woodmagazine.com

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WOOD® Magazine's WOODWORKING SHOWDOWN

ONLINE PROJECT CONTEST

Built a project you're proud of? Upload pictures of it to one of six project categories at woodmagazine.com/showdown. If your fellow woodworkers vote it best in that category, you'll receive a tool prize worth at least $1,000.

FREE VIDEO: TEST YOUR OWN JOINTS

You don't need high-tech testing equipment to learn if your joinery methods are sound. WOOD Tube user Todd Clippinger (*right*) shows a super-simple method at woodmagazine.com/testyourjoints.

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Find downloadable plans for nearly 100 jigs, organizers, and other shop helpers, such as the folding work table at *right*, for only $1.99 each. Visit the *WOOD* Store at woodmagazine.com/store, and click on "Woodworking Plans," then "$2 Tuneups."

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- 5 HP, 220V, single-phase TEFC motor
- Precision ground cast iron table
- Table size: 20¾" W x 29½" L
- Max. cutting height: 14"
- Cutting capacity/throat: 20"
- Blade size: 165" L (¼" - 1⅜" W)
- Blade speed: 4,600 FPM
- Deluxe cast iron fence with extruded aluminum resaw fence attachment

W1770 21" Bandsaw

MADE IN ISO 9001 FACTORY!

10" SLIDING TABLE SAW with Scoring Blade & Riving Knife

New

- 5 HP, 220V, single-phase, TEFC motor
- Table size with extension wings: 40" W x 47" L
- Sliding table size: 12¼" W x 63" L
- Scoring blade dia.: 3⅛"
- Scoring blade arbor speed: 8,000 RPM
- Main blade arbor speed: 4,000 RPM
- Single lever locking fence

W1811 10" Sliding Table Saw

New

18" OPEN END WIDE-BELT SANDER

- 3 HP, 220V, single-phase,1,725 RPM TEFC sanding drum motor
- Variable speed conveyor feed rate
- Sanding drum speed: 1,850 FPM
- Rubber sanding drum dia: 4"
- Pneumatic belt tracking
- Spring belt tensioning system
- 2 steel pressure rollers
- Amp load meter

W1813 18" Wide-Belt Sander

VARIABLE SPEED PLANER/MOULDER with Stand

New

- 2 HP, 220V, single-phase TEFC motor
- Precision ground cast iron table and infeed & outfeed extension wings
- Cutterhead speed: 7,000 RPM
- 2 HSS cutterhead knives
- Number of cuts per minute: 14,000
- Pedestal mounted control switch with variable speed control
- Dovetailed way with precision gib adjustments

W1812 Planer/Moulder

New

SPIRAL CUTTERHEAD PLANERS with Built-in Mobile Base

- 3 HP or 5 HP, 220V, single-phase motor
- Precision ground cast iron table & extension wings
- 2 speed gear box
- 2 adjustable bed rollers
- German-made carbide insert spiral cutterhead
- Pedestal mounted thermal overload magnetic safety switch
- Built-in locking mobile base

W1742S 15" Planer

W1754S 20" Planer

SPIRAL CUTTERHEAD JOINTERS with Parallelogram Adjustable Beds

New

- 110V or 220V, single-phase, TEFC motor
- Precision ground cast iron table
- German-made carbide insert spiral cutterhead
- Quick adjust levers
- Large center mounted cast iron fence
- Pedestal mounted safety switch
- Built-in locking mobile base (W1755S & W1741S)

W1755S 6", 1½ HP Jointer

W1741S 8", 3 HP Jointer

W1744S 12", 3 HP Jointer (does not include the mobile base)

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Jeff designed and built this quartersawn white oak desk for his wife.

Kevin created this cherry trestle table using mortise-and-tenon joinery.

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Mark built this walnut jewelry cabinet for his daughter. When closed, it doubles as a nightstand.

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In Memoriam — E.T. Meredith III (1933–2003)

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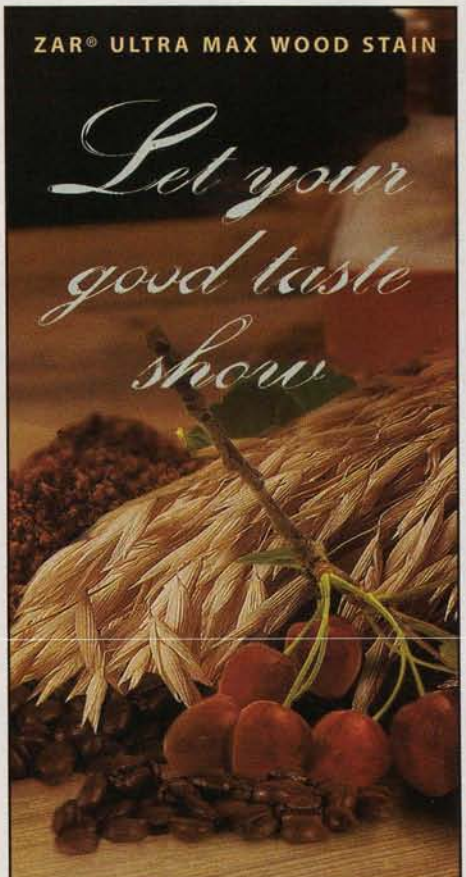

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Sounding Board

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Shaker valet inspires new home for jewelry

My adult daughter recently asked me to build her a jewelry box to replace her falling-apart store-bought one. After thumbing through my old magazines, she decided upon the Shaker-style valet on *page 41* from issue 188 (December/January 2008/2009). I gladly made it from red oak to match her bedroom set. I modified the design slightly, adding wooden drawer glides and a beveled frame around the top for a catch-all. Naturally, she loved it. Thanks for the inspiration!

—Ron Dudelston, Hartford City, Ind.

Toy crane proves a big hit with the kids

When I saw the toy crane project in issue 185 (*page 68*, September 2008), I immediately noticed that its scale matched my G-gauge electric train set and several toy trucks I'd made some time ago. I built the crane, and it was a resounding hit with kids visiting at Christmas time. They dove right in and started playing.

—Mike Effinger, Grafton, Wis.

Thanks for the index

Thank you for reinstating the annual article index in issue 188 (December/January 2008/2009). That listing of articles has proven so helpful to me over the years. Because I don't have a computer, I'm not able to use your online index to search for articles.

—Elwyn Felt, Rockford, Ill.

Article updates

Issue 189 (March 2009)

■ For the Shop Tip on *page 14*, the spacer must equal the length of the hinge *minus the diameter of the bit*, in this case a ¼" spiral bit.

Issue 188 (December/January 2008/2009)

■ Underwriters Laboratories (UL) has moved up the date for manufacturers to comply with its tablesaw riving-knife requirement. As a result, all tablesaws manufactured after Jan. 31, 2010 must include a riving knife in order to get UL approval.

Please work safely

In order to show you precise details in photos, we frequently remove safety guards. In your work, be sure to use all safety devices, as well as wearing vision and hearing protection.

—WOOD magazine editors

HOW TO REACH US

■ **For woodworking advice:**
Post your woodworking questions (joinery, finishing, tools, turning, dust collection, etc.) on one of 16 online forums at **woodmagazine.com/forums**.

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■ For an up-to-date listing of changes in dimensions and buying-guide sources from issue 1 through today, go to **woodmagazine.com/editorial**.

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Shop Tips

Helping you work faster, smarter, and safer

Flawless flutes from a rail-riding router

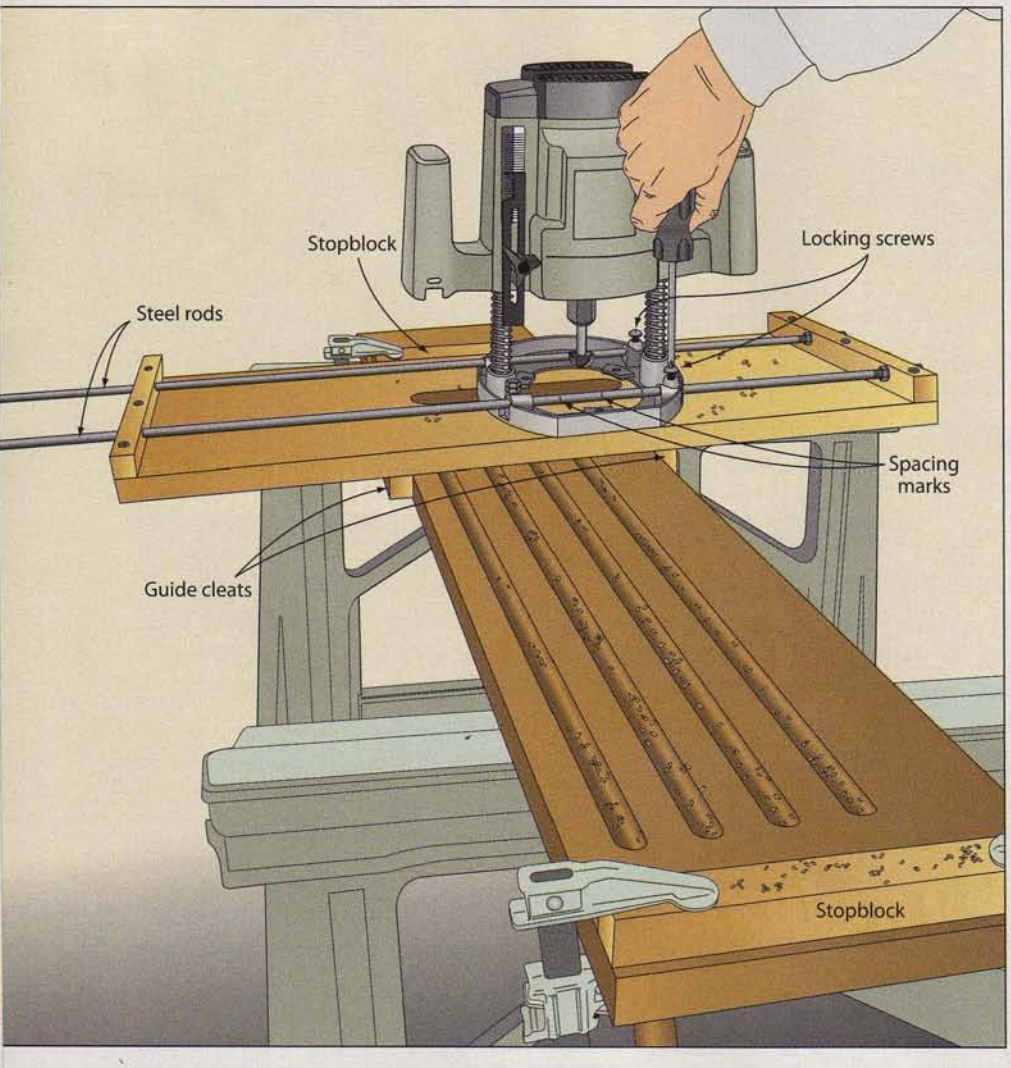
Top Shop Tip

The Federal Bookcase project from *WOOD®* magazine issue 131 (March 2001 or woodstore.net/fedbook.html) inspired me to flute the columns on the fireplace surround I was building for my new house. Because I didn't have a router edge-guide to make the fluting jig in the article, I came up with my own solution shown here.

I made the entire jig out of material from my scrap bin. I placed the guide cleats on the bottom so they slide easily along my workpiece. (They can be removed and reattached with screws for different-width workpieces.) Steel rods slide easily through the edge-guide sockets on my plunge router. I threaded one end of each with a die, and secured them to the fluting jig with lock nuts.

The router rides along the rods and secures in place with locking screws. I marked the centers of the flutes on the rod with a felt-tip pen and aligned each mark with the centerline marked on my router base before routing the flute. The stopblocks clamped to the ends of the workpiece ensure the flutes are all the same length. The two columns came out perfectly matched and dressed up the fireplace surround beautifully.

—Jon Norman, Henderson, Texas



The Top Tipster

Photo: Shelley Mraz

Woodworker Jon Norman has a dream shop. For an auto mechanic, that is. The full complement of mechanic's tools he inherited includes everything from wheel balancers to transmission jacks and take up most of his 30x40' shop. He's carved out a space for his woodworking tools, though. And he put them to good use finishing the house his uncle helped him build.

For sending this issue's Top Shop Tip, Jon will receive a Delta 46-460 variable-speed midi-lathe. That should help skew Jon's shop toward woodworking again!

Top tips earn tools!

Tell us how you've solved a workshop stumper. If we print it, you'll get $100 and a copy of *450+ Best-Ever Shop Tips* (woodmagazine.com/450tips). And, if your idea garners Top Shop Tip honors, we'll also reward you with a tool prize worth at least $300.

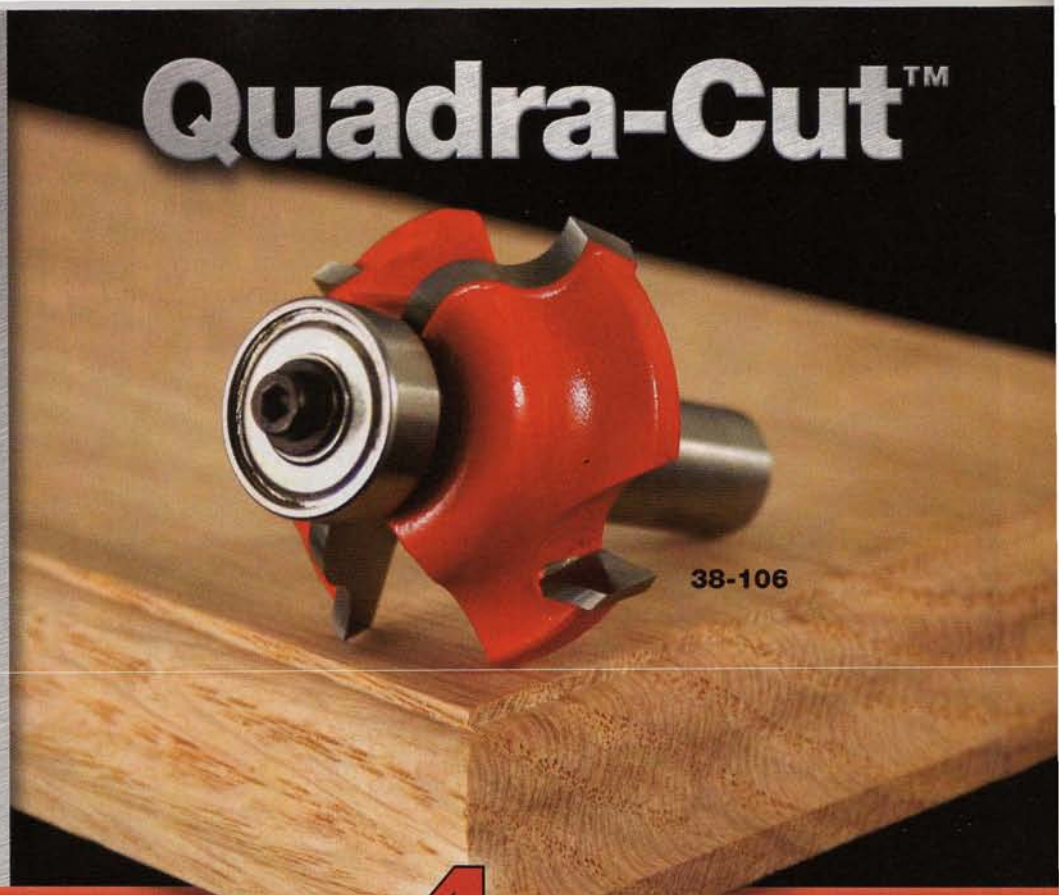
Send your best ideas, along with photos or drawings and your daytime phone number, to: **Shop Tips, WOOD Magazine, 1716 Locust St., LS-221, Des Moines, IA 50309-3023**. Or, by e-mail: shoptips@woodmagazine.com. Include your contact info in the e-mail.

Because we try to publish original tips, please send your tips only to *WOOD®* magazine. Sorry, submitted materials can't be returned.

continued on page 10

What's The Secret To Flawless Edge Profiles With NO REWORK?

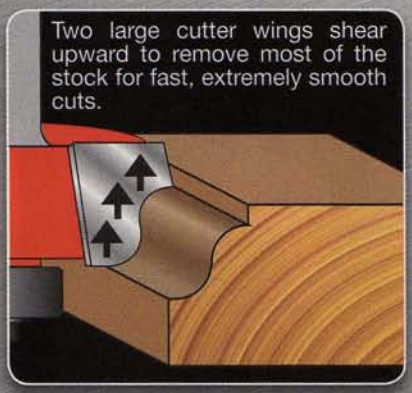
Quadra-Cut™



Freud's New Quadra-Cut™ 4 Cutter Design

How It Works!

Two large cutter wings shear upward to remove most of the stock for fast, extremely smooth cuts.



Two small cutter wings shear downward for an ultra-fine finish, even when routing crossgrain in delicate materials!

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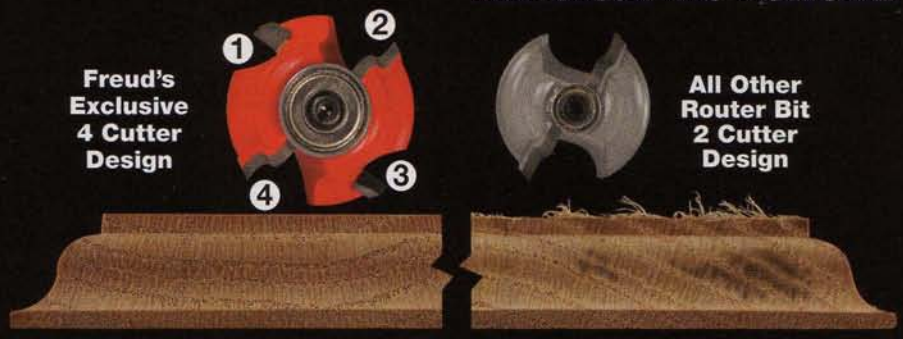

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– Chris Marshall, Woodworker's Journal

"Super-smooth cuts!"
– Glen Huey, Popular Woodworking

Look For These Popular Profiles in 1/2" Shank Quadra-Cut™ Design:

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- Rounding Over Bit, 1/2" Radius
- Rounding Over Bit, 1" Radius
- Beading Bit, 5/16" Radius
- Beading Bit, 1-1/8" Radius
- Table Top Classical Bold Bit
- Table Edge Bit
- Rounding Over Bit, 5/8" Radius
- Rounding Over Bit, 1-1/2" Radius
- Raised Panel Bits

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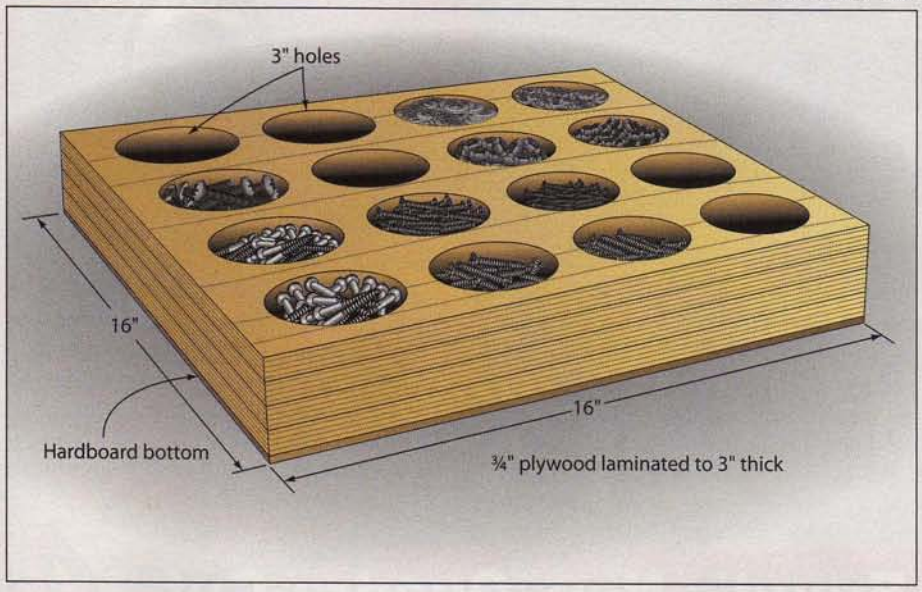
Shop Tips

A hole new way to store loose screws

I'm sure I'm not alone in having a large assortment of screws in my shop. Here's how I organized them: I laminated four pieces of ¾×16×16" plywood. Then, I drilled a grid of 3" holes at the drill press using a hole saw. Finally, I glued a piece of hardboard to the bottom, and once the glue dried, I filled the organizer with screws. Mine fits nicely into my workbench drawer, keeping the screws close at hand.

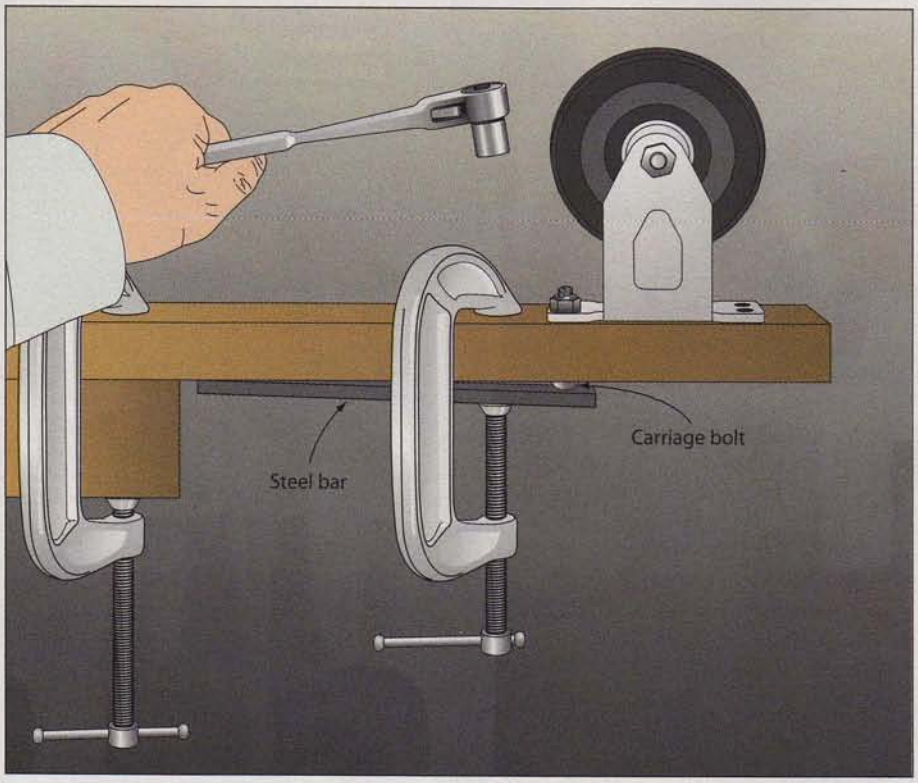
—Joe Bamlett, Calgary, Alta.



Carriage-bolt clencher

If you've ever had a carriage bolt slip when the square collar tears out the wood grain, here's a solution for you. Clamp a steel bar or a flat tool wrench (or a rasp if it's really stubborn) over the bolt head, as shown. The friction on the head gives you enough grip to finish tightening or loosening the nut.

—Richard Wood, Appleton, Wis.



continued on page 12

WOOD® Magazine's WOODWORKING SHOWDOWN

ONLINE PROJECT CONTEST

Announcing the Woodworking Showdown Online Project Contest. Here's your chance to show the world what you do in your shop!

Upload your project photos May 4 thru November 30, in one of six categories. There will be one winner for each category with more than $6,700 in prizes!

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To learn more about the Woodworking Showdown and to upload your project photos, visit: **www.woodmagazine.com/showdown**

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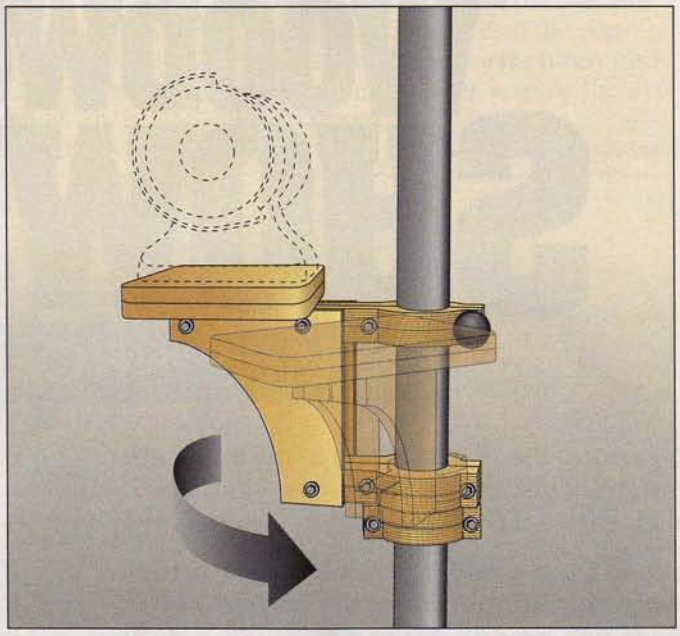
Subject to Official Rules at www.woodmagazine.com/showdown. No purchase necessary to enter or win. To enter, visit www.woodmagazine.com/showdown, complete the registration form, then follow the links and instructions to upload up to six (6) original photos into one (1) album of your original woodworking project. The entry period for the *WOOD Magazine Woodworking Showdown* begins May 4, 2009, and ends November 30, 2009. Entries must be received by 11:59 p.m., C.T., on November 30, 2009. Open to legal residents of the 50 United States, and the District of Columbia, 18 years or older. Multiple entries accepted; each entry must be for a different project. Void where prohibited. Sponsor: Meredith Corporation

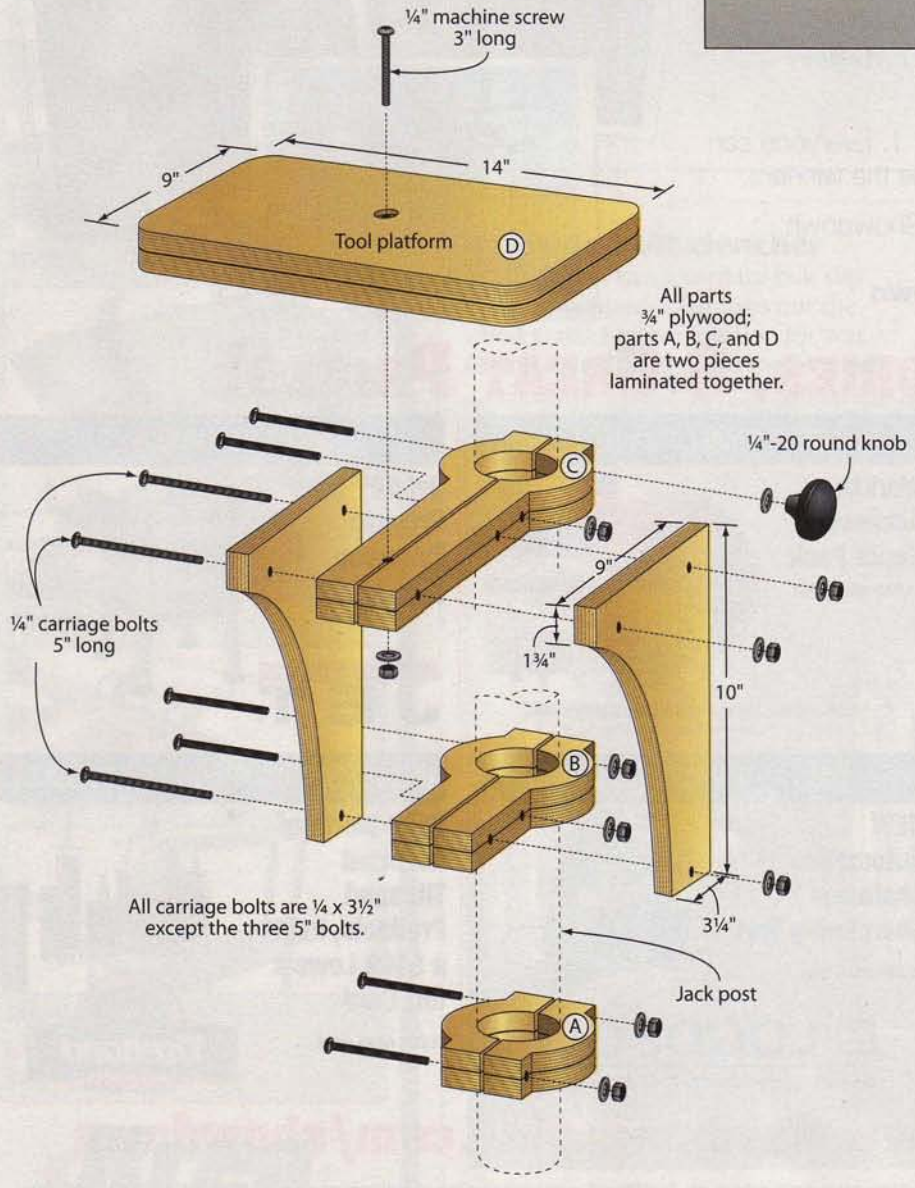
Transform obstructions into shelf space

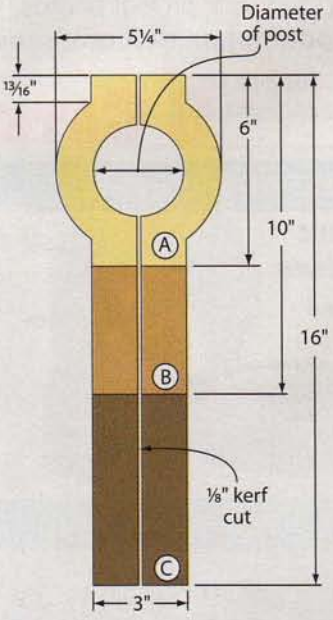
Compounding the problem of my basement shop being too small, its floor is dotted with jack posts supporting the floor joists above. But I turned the problem into a solution with this post-mounted tool platform.

The collar (A) holds the platform at the preferred height. Once secured, I rarely, if ever, move it. Clamps (B) and (C) allow the platform to swivel around the post. Tightening the knob on (C) locks it into position on the post. The tool platform itself can swivel once you loosen the center hold-down screw.

—Jim Murphy, Perth, Ont.







continued on page 14

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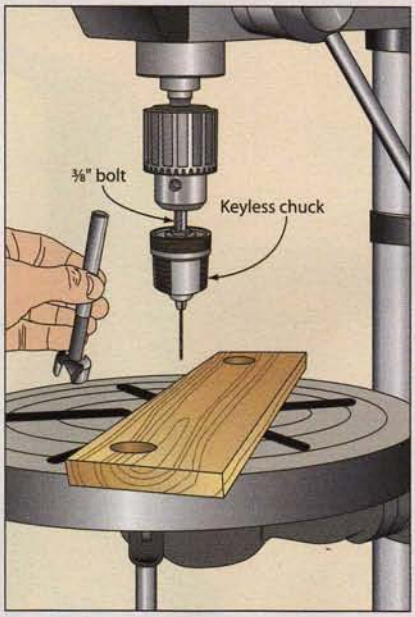
Shop Tips

Easy-change chuck-in-a-chuck

My drill press has become much easier to use thanks to a keyless chuck I salvaged from a dead cordless drill. After removing the chuck from the cordless drill, I simply threaded a ⅜×2½" steel bolt into the ⅜" keyless chuck and cut off the head. The bolt chucks into my drill press, making bit changes a breeze, especially for small bits. As an added benefit, when I change between small and large bits, I don't have to raise and lower the table height to account for the difference in bit length; I simply remove the keyless chuck and insert the longer bit.

—Mark Albrecht, Cody, Wyo.



For a
Daily Shop Tip
visit
woodmagazine.com/tips

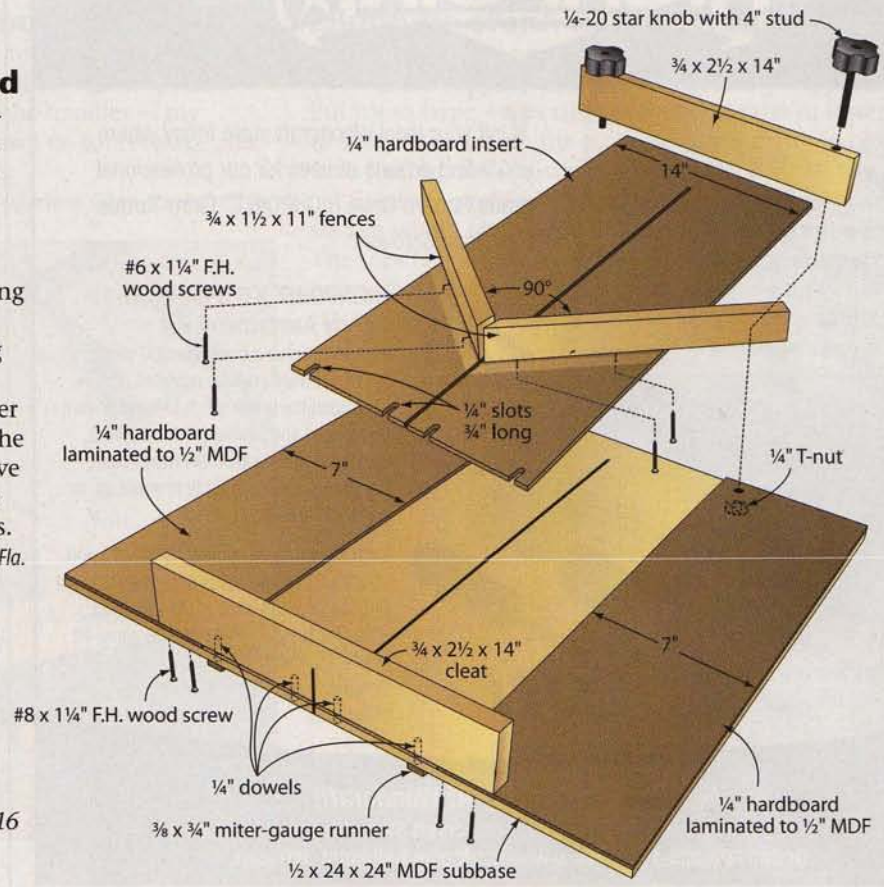
Multi-tasking tablesaw sled

I saw Don Mullikin's Shop Tip "Sacrificial insert saves sled's integrity" in the November 2007 issue (no. 180), which prompted me to send in my version, shown here.

As with Don's design, my sacrificial insert prolongs the sled's life by allowing me to replace the insert when it gets chewed up beyond repair after making bevel or dado cuts.

I took the idea a step further, however by giving each insert a different job. The one shown here does 45° miters, but I've also got an insert for crosscuts, one for dadoes, even one for cutting box joints.

—William Kennedy, St. Petersburg, Fla.


¼-20 star knob with 4" stud
¾ x 2½ x 14"
¼" hardboard insert
14"
¾ x 1½ x 11" fences
#6 x 1¼" F.H. wood screws
90°
¼" slots ¾" long
¼" hardboard laminated to ½" MDF
7"
¼" T-nut
¾ x 2½ x 14" cleat
7"
#8 x 1¼" F.H. wood screw
¼" dowels
⅜ x ¾" miter-gauge runner
¼" hardboard laminated to ½" MDF
½ x 24 x 24" MDF subbase

continued on page 16

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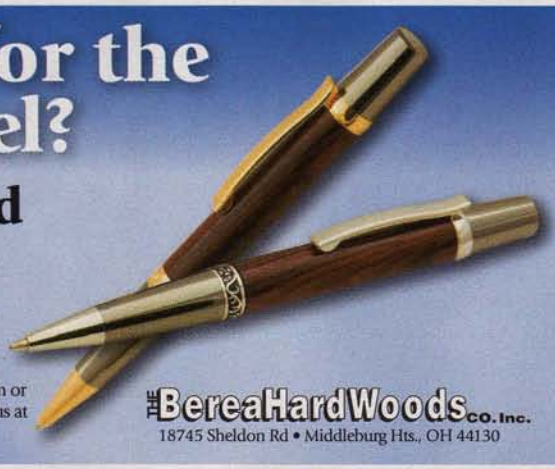

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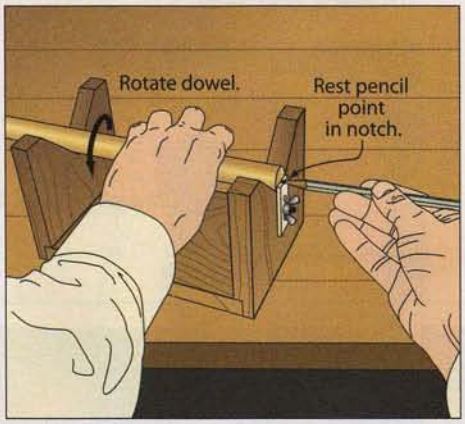
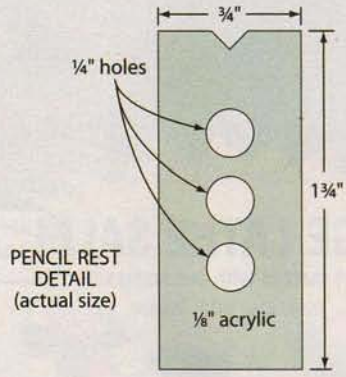
Superior dowel center finder

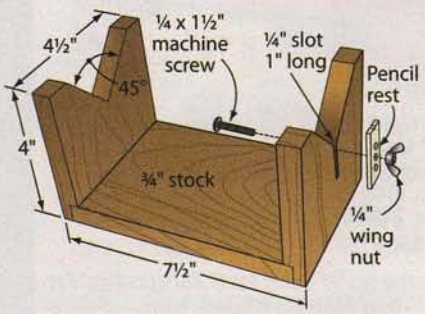
To find the center on the ends of a dowel, I made my own center-finding tool, shown *below*. With the dowel resting in the V's, I rotate it against the point of a pencil inserted into the pencil rest. As the dowel turns, the pencil traces a circle centered on the dowel's center.

By raising or lowering the pencil rest, I can dial in dead center on any dowel, but I find a small circle adequate for drilling or chucking the dowel into my lathe.

—Mark Ostrom, Lindstrom, Minn.



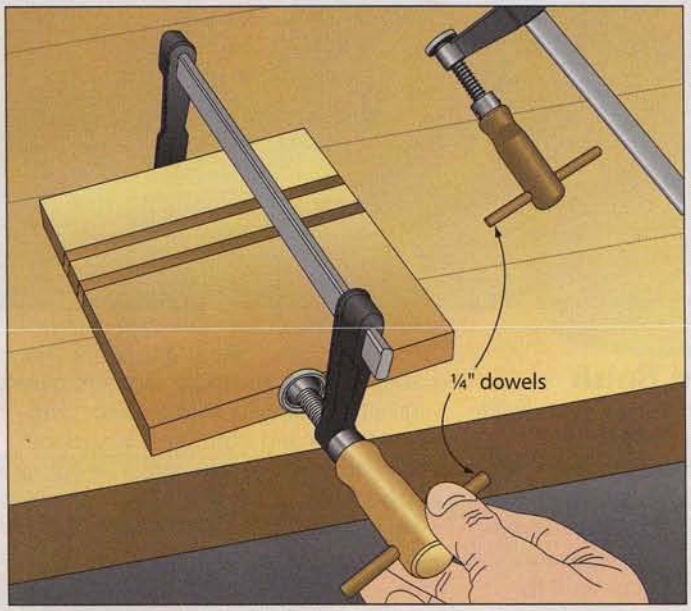




May your clamp exceed your grasp

My hand strength is not what it used to be, making it hard to tighten clamps. So I applied the force of my mind to the problem. I simply drilled ¼" holes in the handles of my clamps and glued in short dowels. Now I've got leverage and all the clamping pressure I need.

—Kenneth Gibbs, Schellsburg, Pa.

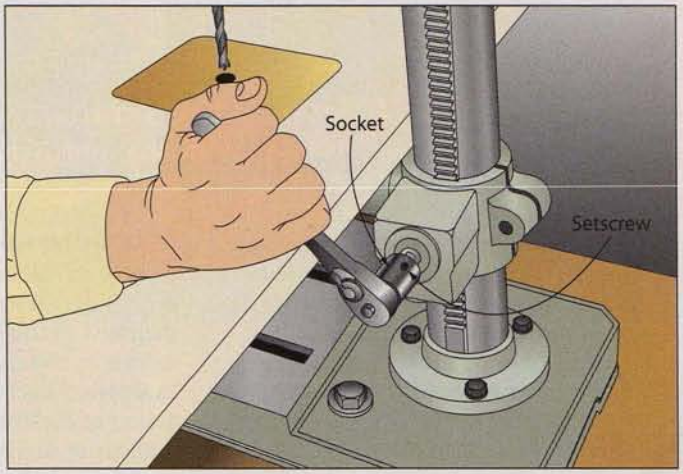


Eliminate crank-handle crankiness

My auxiliary drill-press table adds a lot of surface area for better stock support than the small factory-supplied table. But it's so large, every time I wanted to raise or lower it, I had to slide it away from the table-elevation crank in order to turn the handle—frustrating to say the least.

I fixed the problem by replacing the crank with an old socket, which I had drilled and tapped to accept a setscrew. The setscrew location corresponds with the flat part of the crank shaft and locks it into place. Now I simply use a ratcheting socket wrench to raise or lower the table.

—Concepcion Ortiz, Sioux City, Iowa



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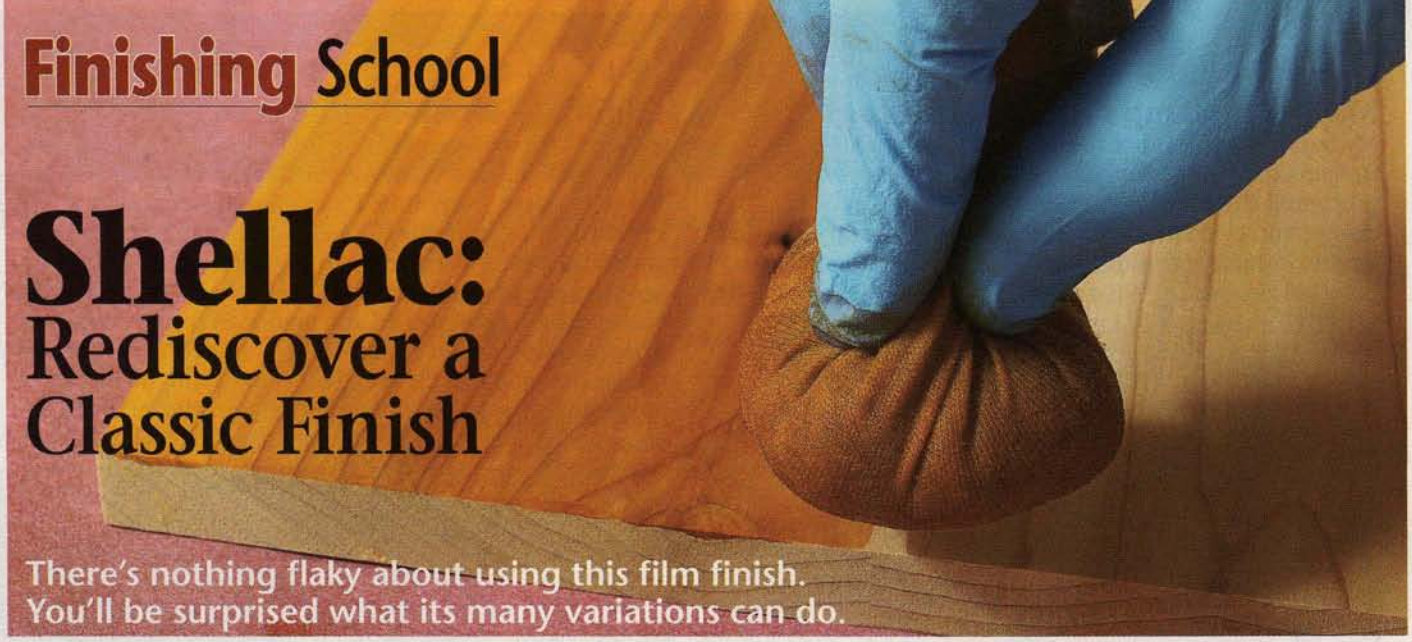
Shellac: Rediscover a Classic Finish



There's nothing flaky about using this film finish. You'll be surprised what its many variations can do.

For a centuries-old finish, shellac offers plenty of modern benefits: It dries quickly, doesn't darken with age, produces few odors, and you can repair damage in a jiffy. But its one-time popularity faded for a reason: Fast drying reduces leveling. Also, it suffers a shorter shelf life and takes a back seat to poly's resistance to abrasion, heat, and spills (especially alcohol).

Despite that, shellac beats polyurethane as a rubbed-out finish that can pop the grain on such woods as walnut and mahogany as it leaves a warm color. And that's only the start:

- A thin wash coat keeps stain from blotching such woods as cherry.
- It seals resins in pine.
- By adding universal colorants, such as Mixol or those used by paint stores, you create a colorful, semi-transparent finish [**Photo A**]. Or mix in alcohol-based dye for a tinted shellac finish.

Choose flakes or premixed

Shellac makes such a versatile finish partly because you can alter it to fit your needs. Want to deepen wood's natural color? Shellac flakes vary from garnet to orange, amber, blonde, and the mostly clear super-blonde.

Do you value control or convenience? Mixing shellac from flakes opens up more color options, lets you control the thickness of the shellac, and guarantees freshness. Premixed shellac saves time, but it's more limited. For example, premixed Bulls Eye Shellac contains wax that makes it unusable as a sealer under polyurethane. SealCoat comes de-waxed, but produces thinner coats than Bulls Eye Shellac. (See **Sources**.)

Mix your own finish

To mix shellac from flakes, first decide on a concentration (called a *cut*) matched to the job you're doing, as shown in the charts at *right*. For example, 3 lbs of shellac flakes in one gallon of denatured alcohol produces a 3-lb cut of shellac (the cut used for premixed shellac). You can thin premixed shellac for different jobs, too.

Flake shellac deteriorates about six months after mixing, so make only what you need immediately. Flakes dissolve best when ground into powder [**Photo B**, *page 20*], and mixed with a fresh, unopened can of denatured alcohol. Allow the shellac to dissolve overnight; then pour the mix through fine cheesecloth or a paint filter to strain debris and lumps [**Photo C**, *page 20*]. Label and date the cut.

Make application easy

Prepare the wood for finishing by sanding up to 220 grit. The darker your shellac color, the more care you need to take because dark shellac, like stain, collects in and highlights scratches.

A cloth pad makes applying a 1- or 1½-lb cut of shellac nearly foolproof. Each wiped-on coat goes on thinner than a brushed-on 2- or 3-lb cut, so you may need more coats. Also, wiping works best on flat project part surfaces finished separately before assembly because you don't have to worry about finish becoming trapped in corners.

To make an applicator pad, wrap a tightly-woven, lint-free fabric, such as an old linen handkerchief or washed

COLOR SHELLAC AS A TONER

A

Adding Mixol #4 oxide red and #10 red to a quart of SealCoat makes a translucent finish.

A cut for every job

CUT	USES	SHELLAC*
½-lb	Light wash coat for controlling blotches	1 oz
¾-lb	Medium wash coat, airbrush sprayer	1½ oz
1-lb	French polishing, touch-up sprayer	2 oz
1½-lb	Wiping, padding	3 oz
2-lb	General finishing, brushing on	4 oz
3-lb	Sealing knots, sap; brushing for experienced users	6 oz

*Mix this amount of shellac (by weight) to one pint (16 oz) of alcohol.

Customize canned shellac

CHANGE IN CUT	ADD THIS ALCOHOL	TO THIS SHELLAC
3-lb to 2-lb	2 parts	5 parts
3-lb to 1-lb	3 parts	2 parts
2-lb to 1-lb	1 part	1 part

Zinsser premixed shellac equals a 3-pound cut while the sealer equals a 2-pound cut.

continued on page 20

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T-shirt, around cotton batting or a ball of wool the size of a golf ball. Then pour enough shellac into the inside of the pad that it starts to moisten the outside cover without dripping.

Beneath a light angled to reflect finish flaws, make long strokes across the wood. Wipe outward from a moist edge without going over the same area repeatedly. As the pad dries, replenish it with more shellac. If the pad begins to harden, add alcohol to soften it.

After 45 minutes, sand the first coat lightly using 220 grit. Apply additional coats, but now wait at least an hour between them before sanding.

If the pad begins to drag while applying more coats, that's the wet shellac partially dissolving the coat beneath. To minimize that, wipe a strip on once and move on. Unless you apply too much shellac at once, you won't leave ridges on the work surface from the edges of the pad. Four wiped-on coats should do for most projects.

Brush in a rush

After you get the hang of brushing on shellac that dries in minutes, not hours, applying polyurethane will feel like moving in slow motion.

Start with a natural-bristle brush. Traditionalists prefer badger bristle, but any brush with fine, natural hairs will do. Fine bristles, like those on the brush shown [**Photo D**], leave a surface that levels within shellac's rapid drying time. If you're a shellac newbie, use a 1-lb cut for the sealer coat and a 1½-lb or 2-lb cut for topcoats.

Instead of brushing back and forth as with poly, lay down shellac in one pass. Make long strokes out from a wet edge. If you see brush strokes on a dried coat, thin the shellac until it levels off before drying. If you miss a spot, keep going and catch it with the next coat.

Allow the sealer coat two hours to dry in a well-ventilated area before sanding with 220-grit. Then wait two hours for each topcoat to dry, and sand away mistakes or brush marks.

Take a shine to shellac

Before rubbing out several coats of shellac, give the finish at least two days to dry in a well-ventilated area. To begin, level the surface by sanding from 320 grit up through 600 grit using wet/dry sandpaper lubricated with mineral oil to prevent clogging. Clean the surface between grits with mineral spirits and check your progress.

For a high-gloss finish, sand up to 1,500 grit. Then polish the surface with an abrasive, such as rottenstone, in mineral oil or an automotive buffing compound (available at auto parts stores) and a stiff-backed felt pad.

GRINDING HELPS SHELLAC MIX

B

Grinding flakes to a powder (*left*) helps shellac dissolve in denatured alcohol, leaving fewer globs on the bottom of the jar.

STRAIN FRESHLY MIXED SHELLAC

C

Allow shellac to dissolve overnight in alcohol; then strain it through cloth or a medium-mesh filter to remove lumps and impurities.

FINE HAIRS LEAVE FEWER RIDGES

D

The finer the hairs, the fewer shellac ridges a brush leaves behind. The thick, gap-free body of this brush leaves less to sand than synthetic-bristle paint brushes.

Written by **Bob Wilson** with **Alan Noel**

Sources

Premixed shellac. Bulls Eye Shellac (clear or amber) or SealCoat, Zinsser Co., zinsser.com. Available at home centers and hardware stores.

Shellac flakes. Super-blonde ($22.70/lb), amber ($10.70/lb), and garnet ($13.65/lb), Hardwood Lumber and More, 866-553-5883 or hardwoodlumberandmore.com.

Shellac brushes. Gramercy ox-hair brushes (2") no. GT-SHEBRU.20, $40, Tools for Working Wood, 800-426-4613 or toolsforworkingwood.com.

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For a no-math approach, use the simple jig like the one we created to make the beveled and tapered sides of the Limbert-style table on *page32*.

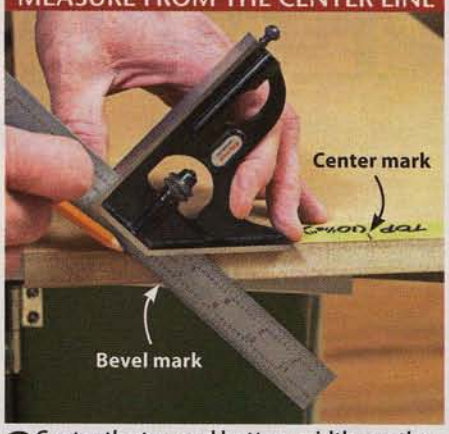
Build a custom tapering jig

Unlike some jigs, you'll tailor this one to suit your project part sizes. First cut a tapering-jig base from flat sheet stock, such as medium-density fiberboard (MDF), 8" longer and 2" wider than the blanks you'll taper. (For the 13×28" panels on the Limbert-style table, we cut the base 15×36".) Then, from scrap about 1/16" thinner than your test pieces or project parts, cut four 2×5" hold-downs and stopblocks for the ends of the workpiece and a 1½×24" stopblock for the long edge. (For other projects, cut this stopblock 4" shorter than the edge being tapered and beveled.)

Next cut four workpiece blanks and four MDF test blanks ¼" oversize in width. Mark the outside width of the narrow and wide ends of the project part centered on one test blank. Now follow the six simple steps shown in the photos to cut the beveled tapers. For more information on the jig, go to woodmagazine.com/beveledtaper.

1 Bevel-cut one edge of the base to 45°. (You can adjust the bevel angle later, if necessary.) Then set the jig base aside.

MEASURE FROM THE CENTER LINE

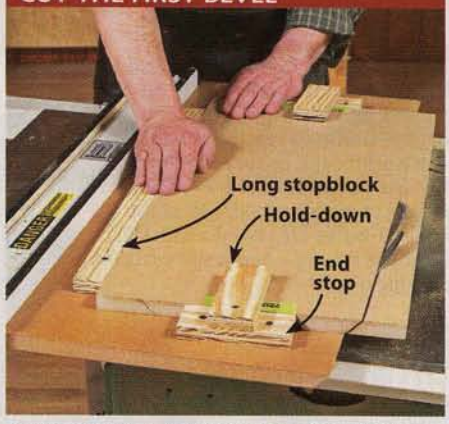


2 Center the top and bottom widths on the outside face of a test blank, and mark the ends. Then use a combination square or sliding bevel to transfer 45° bevel lines on the blank ends.

ALIGN MARKS WITH THE JIG EDGE

3 Center the test blank along the length of the jig base, and align the bevel marks with the beveled edge of the base. Before installing the stopblocks, mark the stopblock edges that will butt against the test blank.

CUT THE FIRST BEVEL



4 Hold the long stopblock against the test blank edge, and screw it to the jig base. Then add the end stops and hold-downs. With the jig in position against the rip fence, make the first bevel cut on each test blank.

REMOUNT THE STOPBLOCKS

5 Remove all three stops, and turn the blank end for end. Align the bevel marks on the ends of the test blank with the beveled jig edge. Reattach the long stopblock against the beveled edge.

CUT THE SECOND BEVEL

6 Reattach the end stops in new positions with the same end-stop edges against the test blank as before. Then rip the second bevel on each test blank.

Now see how you did

To test the results of your jig set-up, tape together the four completed test parts and check for gaps along the miters. For the Limbert-style table, a 45° angle leaves only a tiny gap on the inside corner of the joint that can be filled with glue. More important, this angle creates a tight fit on the outside corners where it matters most.

If you see inside corner gaps greater than 1/16", decrease the blade tilt by a half degree, tape a 1/8"-thick spacer to the long stop, and recut the beveled jig edge. Then rip new bevels on each test blank, and repeat until you achieve tight joints with no outside gaps. Now repeat the jig set-ups, and cut your project parts.

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Kevin Boyle, Senior Design Editor

32" LE Router Table Fence, #LEFNC616, $130;
Woodpeckers, 800-752-0725, woodpeck.com

"I've looked at, and tested, a lot of feather boards over the years, and these from Milescraft are my favorites. A single, shorter first finger, and the open body make setting the tension a cinch. Sold as a pair, I stack them for tall workpieces, or separate them to provide both in- and down-pressure, as shown here. And they appeal to my frugal side: All of the hardware (miter bars, T-bolts, etc.) comes with this model to use in all those setups—and it still costs less than buying two single models!"

Dave Campbell, Deputy Editor

Dual/Tandem Feather Board, #1407, $30;
Milescraft, 847-683-9200, milescraft.com

"I always have extruded aluminum T-track on hand because I build a ton of jigs. It's so versatile. And I wouldn't own a router table without it or combo track, because they're ideal for guiding and securing these accessories: feather boards, stops, safety guards, and a miter gauge. The combo track (miter U-channel and T-slot side-by-side) is perfect because all those accessories work in it. Trust me, buy extra lengths of both—you'll find yourself using it for a lot more than routing."

Jeff Mertz, Design Editor

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"For years I used a fixed-base router in my table, and every time I rotated it to adjust the bit height the power switch rotated to a new spot. I was always fumbling under the table trying to locate that switch. Then I tried this auxiliary power switch, and it was like when someone invented the automatic bread slicer: Hallelujah! Now I control the power without reaching below the table. I'll never own another router table without an auxiliary switch."

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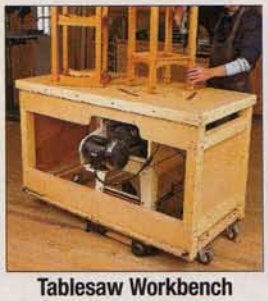

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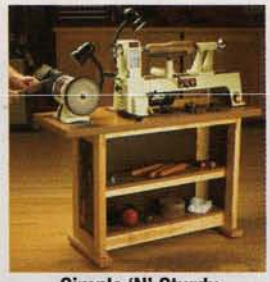

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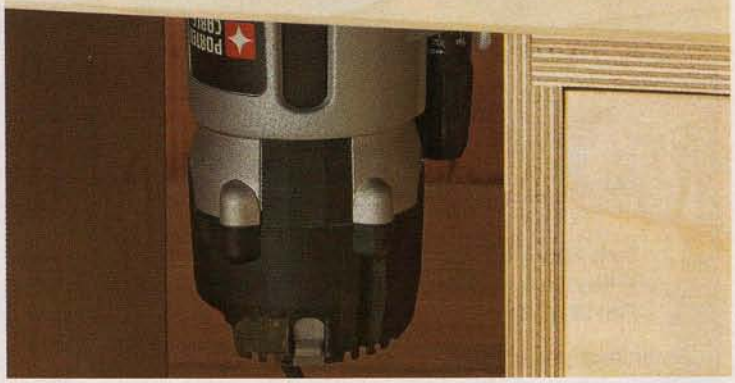
The Perfect Router for Table Mounting

Is there such a thing? We found three that fit the bill.

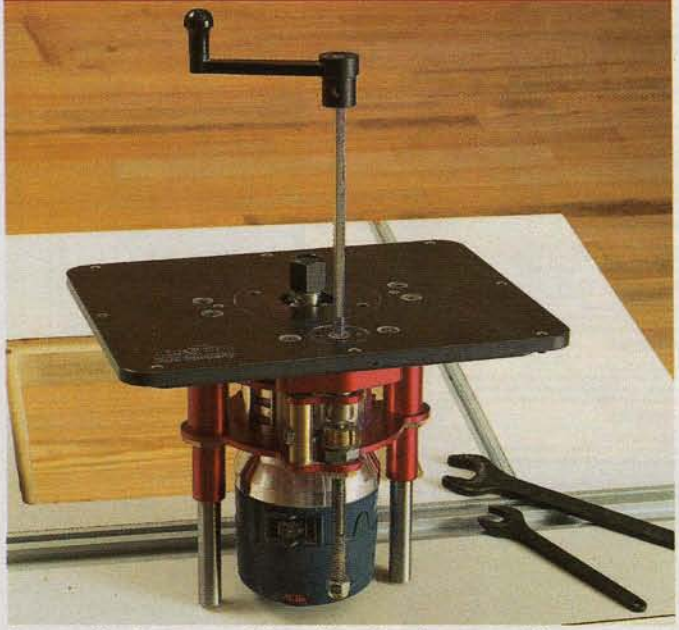
A good table-mounted router makes bit changes hassle-free. An angled wrench to hold the spindle sure helps.



Although you can mount nearly any handheld router upside down in a router table, some are better suited to this line of duty than others. For example, many routers now sport built-in lift mechanisms that you crank to adjust bit heights from above the table, as shown at *right*, without removing the router or reaching below the table. These routers typically require an extra hole in the insert plate to operate the lift mechanism. But beware: With some of these routers you still have to reach below the tabletop to lock the collet, negating half the benefit of a lift.

If you already have a router you like and don't want to upgrade, you might be able to get the same convenience by installing its motor in a router lift. These units come attached to insert plates with adjustment mechanisms built in, as shown *below*. Keep in mind, though, that with prices ranging from $175 to $450, a lift might cost more than a new router. Router lifts specify which router models will fit, and some require adapters.

GIVE YOUR ORDINARY ROUTER A LIFT



A router lift, shown out of the table, raises the router fully so you can change bits above the table without angled wrenches.

You should also look for a router with variable speeds so you can slow it down for large-diameter bits. Another essential feature: electronic speed control, which maintains rpms when the routing gets tough. A 3-hp motor really hogs away material, but a midsize model (1½ to 2¼ hp) will get you by if you taker lighter cuts.

When mounting any router in a table, position it so the variable-speed control will be easy to reach, because this cannot be controlled from above. Add an auxiliary power switch to avoid reaching under the table each time to power the router. Also, be careful to mount the router so any above-the-table adjustments won't be covered by the fence during operation, because you might need to tweak a bit's height with the fence in place.

Recommended routers

We've used a lot of routers over the years at *WOOD®* magazine. These three rank among the best for table routing:

Porter-Cable #892, 2¼ hp, 10,000–23,000 rpm, $190, 888-848-5175, deltaportercable.com.
- The 892 features two power switches plus a speed dial marked in rpms, and its lift mechanism works smoothly and accurately.

Triton #MOF001, 2¼ hp, 8,000–21,000 rpm, $220, 888-874-8661, tritonwoodworking.com.
- This easy-to-use router with built-in safety switch won't accidentally power up while you're changing bits.

Freud #FT3000VCE, 3 hp, 8,000–21,000 rpm, $350, 800-334-4107, freudtools.com.
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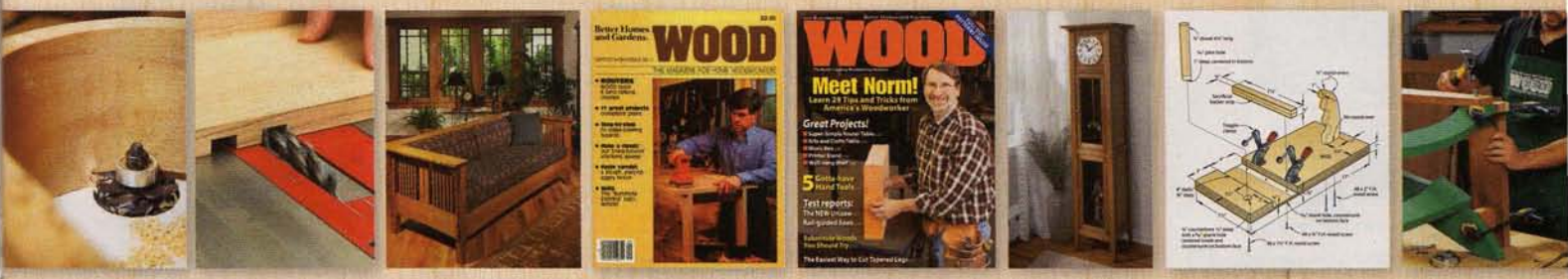

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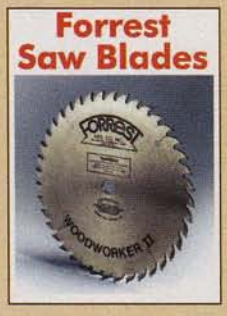

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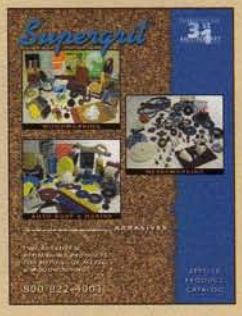

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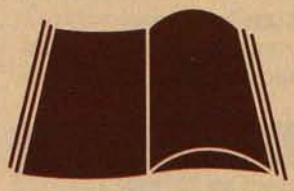

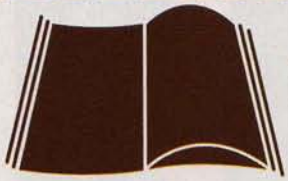

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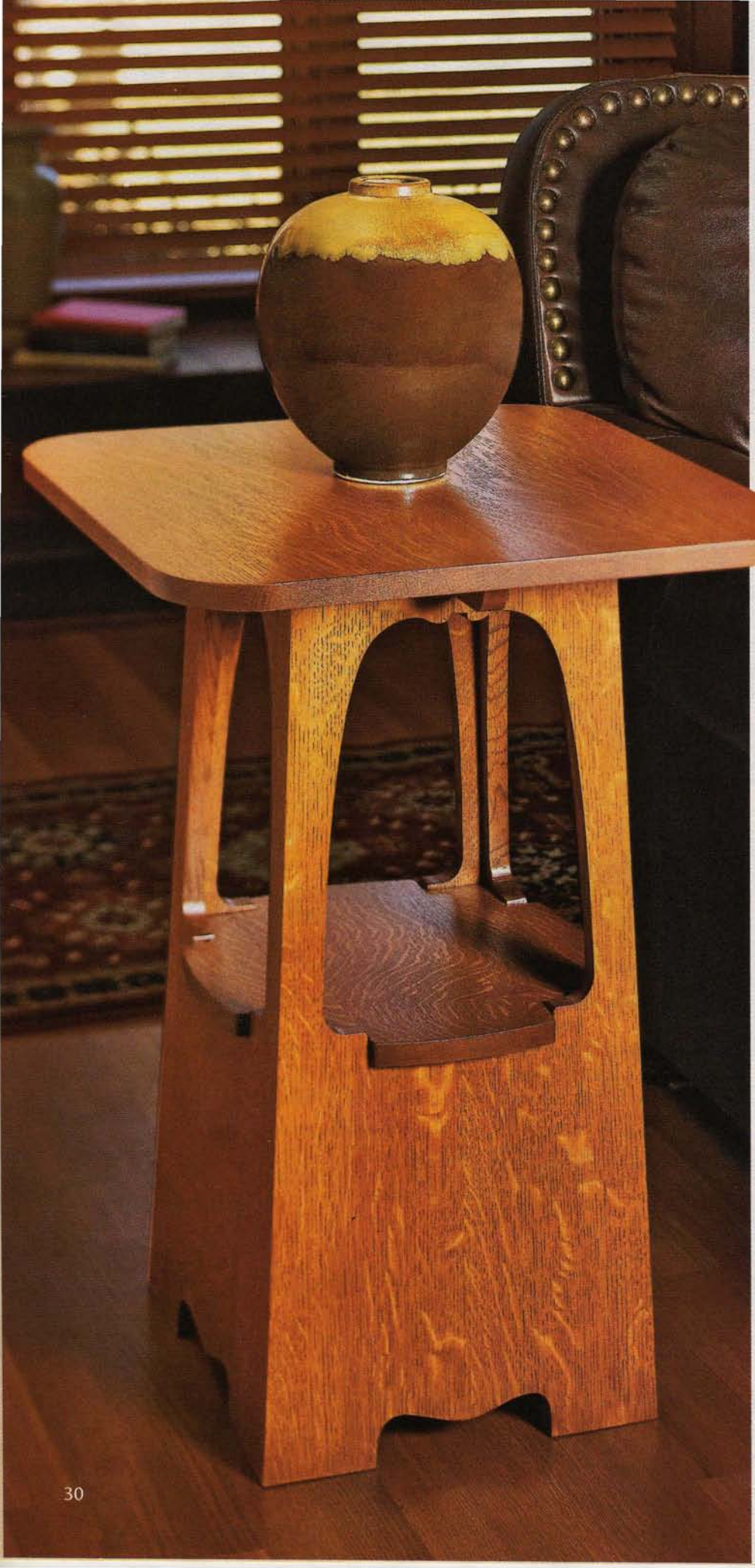


Limbert-style Arts & Crafts Table

Around the turn of the 20th century, Charles Limbert developed a distinctive furniture style. While inherently Arts & Crafts, it also used curves and decorative cutouts. Here's our take on one of his classics.

The beveled edges of this table's base let the quartersawn oak grain extend right to the edge on all four faces. Cutting bevels on tapered panels might seem daunting, but, using patterns and a tablesaw sled, we'll show you how to cut four identically shaped sides that come together precisely for a stunning appearance from any angle.

Prepare the panels and work the angles

1 Start by edge-gluing oversize blanks for the sides (A) and shelf (B) [**Materials List**, *page 33*]. After the glue dries, rip the sides (A) so the edges are parallel. Cut the shelf to 13" square. Next, mill a ¾×1¼×12" blank for the shelf cleats (C), and cut the stretchers (D) to size. Tilt your tablesaw blade to 3° and rip a bevel on one edge of the shelf cleat blank; then set the stretchers, cleat blank, and shelf aside.

2 With the tablesaw blade still tilted 3°, bevel-cut one end of each side (A). Flip the panel over and end for end and crosscut the opposite end to make the

PROJECT HIGHLIGHTS

- Overall dimensions are 20" wide × 20" deep × 28¾" high.
- Materials needed: Quartersawn white oak.

panel 28" long [**Drawing 1a**]. ***Note:*** *The bevels should be parallel, not angled toward each other.*

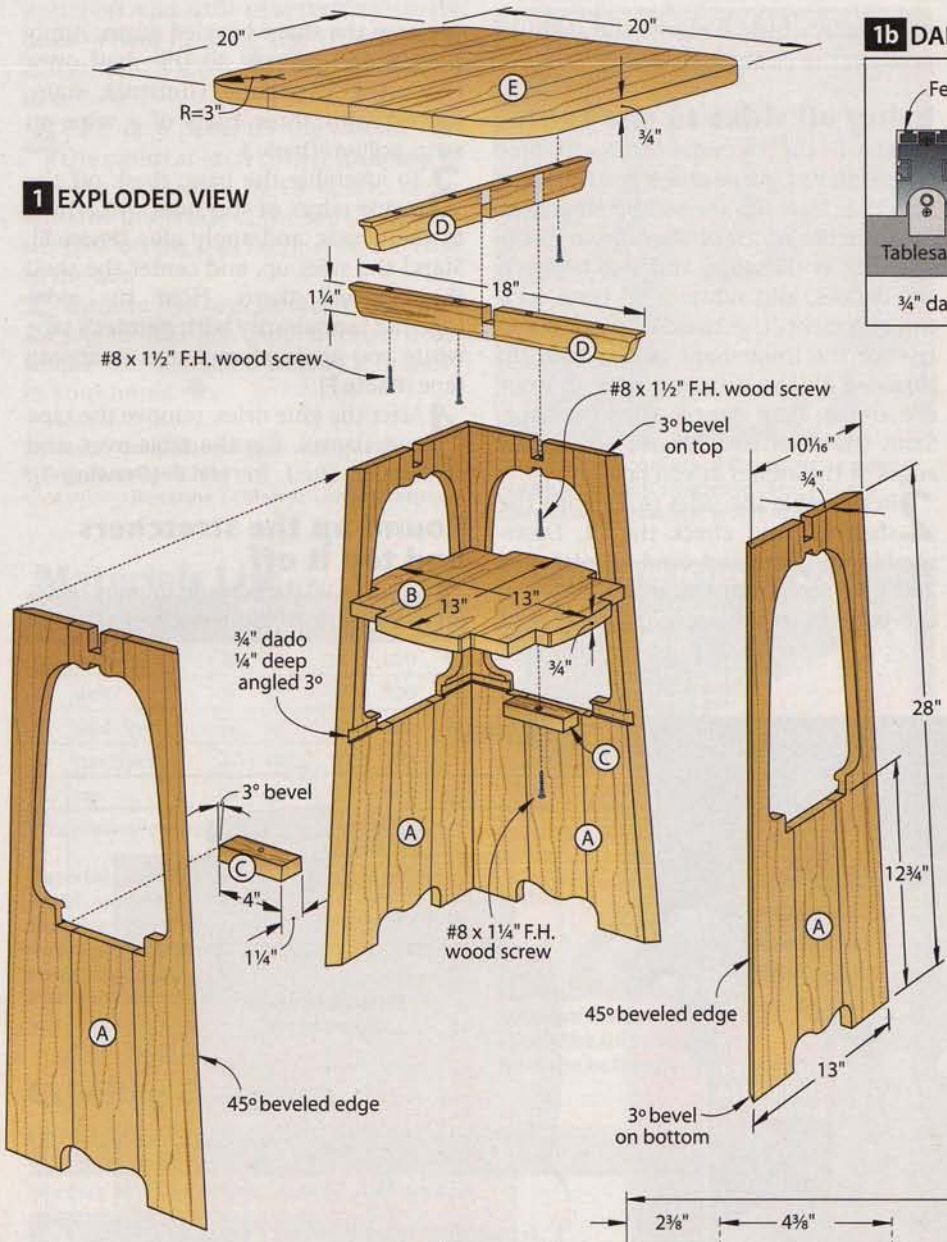
3 Without changing the tilt of the arbor, mount a ¾" dado set on your tablesaw. Measuring from the low side of the blade, set the blade height so the highest tooth is ¼" above the table [**Drawing 1b**]. Set the rip fence to cut a dado 12 13/16" from the bottom edge of the panel [**Drawings 1a, 1b**]. Check your setup with test cuts on scrap; then cut a dado in each side (A).

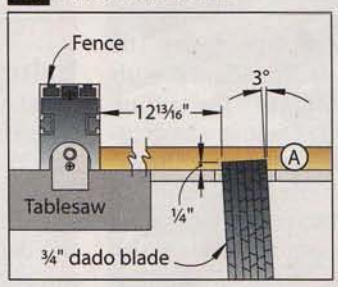
4 Reinstall a rip or combination blade in the tablesaw, and tilt the blade to 45°. Use a shop-made jig, as shown on *page 22*, to bevel-rip the sides and cut the tapers at the same time.

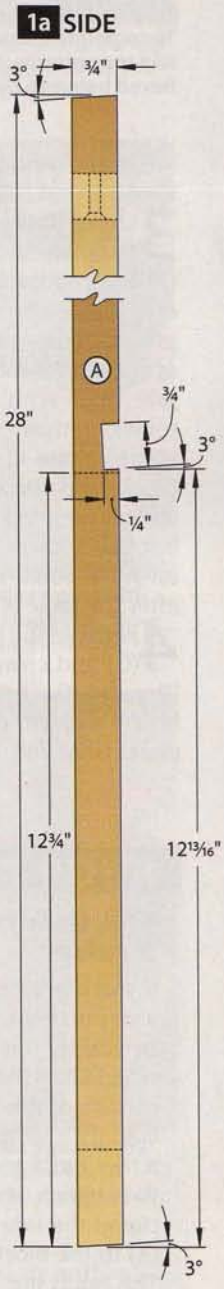
A pattern develops

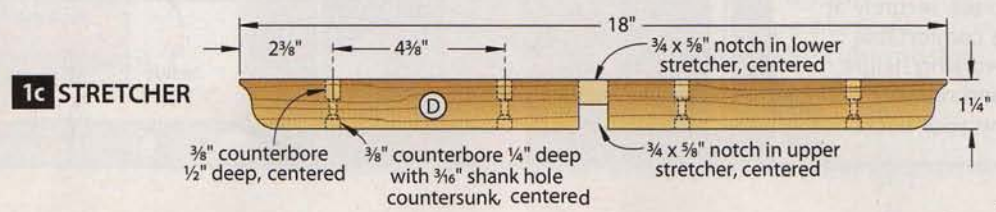
1 The openings in each side (A) are made using a template and a pattern routing bit. To make the template, lay a side (A) outside-face down on a sheet of ½" MDF and trace around it. Cut the MDF along the lines. Make two copies of each **Side Pattern** from the *WOOD Patterns®* insert. Spray-adhere a top and bottom pattern to the template, aligned with the left edge. ***Quick Tip! Shortcut to a mirror image.*** The patterns for the right side mount facedown so they mirror the left side. Cut these patterns along the solid lines before mounting them to the side [**Photo A**]. Draw a line 12¾" from the bottom edge of the template and align the middle patterns with this mark. Lay out the remainder of the curve, as shown in **Photo A**.

2 Drill ⅜" starter holes in the waste area of the template and, using a jigsaw, cut out the opening close to the layout lines. Cut the leg profile at the bottom and the notch at the top, taking care to keep the notch centered. Test the fit of a stretcher



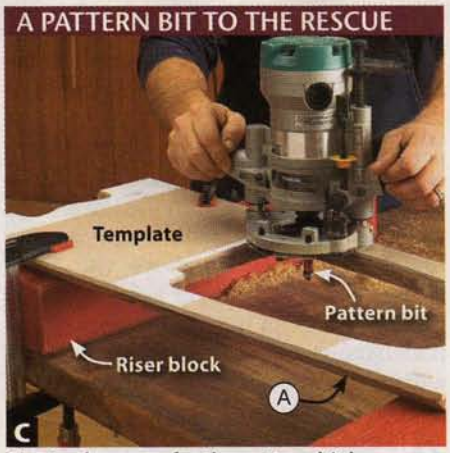






To complete the curve between the middle and top patterns, trace along a piece of scrap flexed between the lines on the patterns.

Secure the template to each side (A) and trace the opening, the top notch, and the bottom cutout onto each panel.



Create clearance for the pattern bit by placing the template and side (A) on riser blocks. Take light passes to prevent chip-out.

(D) in the notch as you go. File and sand to the layout lines.

3 Using double-faced tape, fasten the template to a side (A), aligned with the ends and edges, and trace the outline of the side [**Photo B**]. Remove the template and cut out the waste to within 1/16" of the lines. Reattach the template to the side and, with a pattern bit in your router, remove the remainder of the waste [**Photo C**]. Use a chisel, sanding block, and file to clean up the corners the bit couldn't reach [**Shop Tip** *below*], but leave the notches slightly shallow for now. You'll file them to final depth after the table is assembled.

4 Retrieve the blank for the shelf cleats (C) and crosscut the parts to length [**Drawing 1**]. Drill a countersunk shank hole centered on the length of each cleat. Glue the cleats in place, using a piece of 3/4"-thick scrap in the dado to position the cleat [**Photo D**].

Bring all sides to the table

1 Dry-fit the four sides (A/C) with blue painter's tape to check the fit. Make sure the cleats (C) are on opposite sides. Measure the width of the bottom of the opening in the sides, and also between the dadoes, and subtract 1/8" from each measurement. Use these dimensions to lay out the final shape of the shelf (B) [**Drawing 2**]. Use a fairing stick to draw the arches; then cut the shelf to shape. Sand the shelf to 220 grit, easing the edges of the arches as you do.

2 Reassemble the sides (A/C) with the shelf (B) and check the fit. Disassemble the parts and sand all pieces to 220 grit, including the inside edges of the cutouts in the sides. Be careful to preserve the sharp beveled edges. Apply a stain and topcoat to the shelf only. (We used Varathane Gunstock stain, topped with three coats of a wipe-on satin polyurethane.)

3 To assemble the base, mask off the inside edges of the sides (A/C) next to the bevels, and apply glue [**Photo E**]. Stand the sides up, and center the shelf (B) between them. Hold the sides together temporarily with painter's tape while you apply clamps and strapping tape [**Photo F**].

4 After the glue dries, remove the tape and clamps, flip the table over, and screw the shelf in place [**Drawing 1**].

Round up the stretchers and top it off

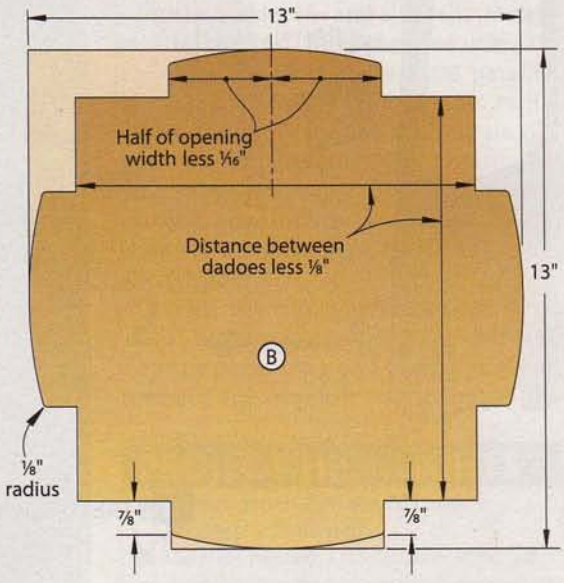
1 Set up a 1/2" dado blade in your tablesaw. Retrieve the stretchers (D) and

SHOP TIP

You deserve a raise

If you don't have a vise on your bench, try this when filing the corners of the cutouts: Clamp a riser block to your bench, then clamp the side (A) to the block. This holds the piece securely at a comfortable working height and reduces strain on your back.

2 SHELF



cut a centered half-lap joint in each one [**Photo G, Drawing 1c**].

2 Dry-fit the stretchers (D) in the notches in the table base (A/B/C). If the tops of the stretchers sit above the tops of the sides (A), measure the discrepancy [**Photo H**] and file the notches to the proper depth.

3 Make four copies of the **Stretcher Half-pattern** from the *WOOD Patterns®* insert and spray-adhere one to each end of each stretcher (D). Note that the half-lap faces up on one stretcher and down on the other. Cut the ends to shape, and drill the counterbores and shank holes where indicated. Turn the table (A/B/C) upside down on the stretchers and drill countersunk shank holes [**Photo I**]. Sand the stretchers to 220 grit; then screw them in place in the table base.

4 Glue up a panel for the top (E). Cut the radius at each corner [**Drawing 1**]. Flip the table base (A–D) upside down onto the underside of the top (E). Center the base on the top; then screw the base to the top.

5 Remove the top; sand the base and top to 220 grit. Apply finish, reassemble the table, and display it proudly in your home.

Written by **Craig Ruegsegger** with **Jeff Mertz**
Project design: **Jeff Mertz**
Illustrations: **Roxanne LeMoine**; **Lorna Johnson**

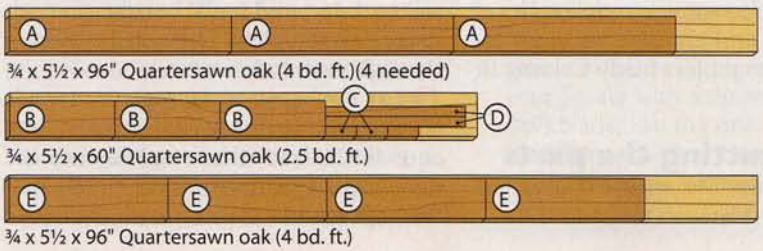
Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
*A	sides	¾"	13"	28"	EQO	4
*B	shelf	¾"	13"	13"	EQO	1
*C	shelf cleats	¾"	1¼"	4"	QO	2
D	stretchers	¾"	1¼"	18"	QO	2
*E	top	¾"	20"	20"	EQO	1

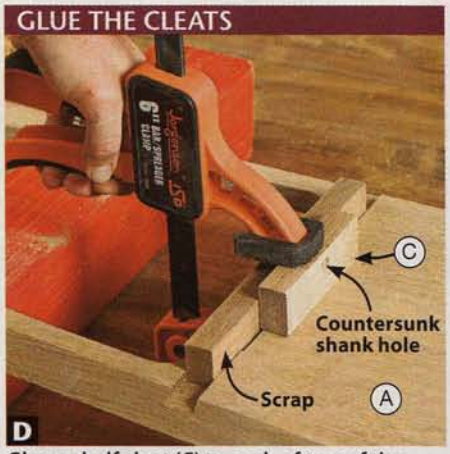
*Parts initially cut oversize. See the instructions.

Materials key: EQO–Edge-joined quartersawn white oak, QO–quartersawn white oak.
Supplies: Spray adhesive, double-faced tape, strapping tape, #8x1¼" flathead wood screws (2), #8x1½" flathead wood screws (12).
Blade and bit: Stacked dado set, pattern router bit.

Cutting Diagram



GLUE THE CLEATS



Glue a shelf cleat (C) to each of two of the sides (A), with the countersink on the shank hole facing the bottom.

WHITE GLUE BUYS YOU TIME

White glue allows more working time during assembly. Glue two sides together, then the other two, then join those assemblies.

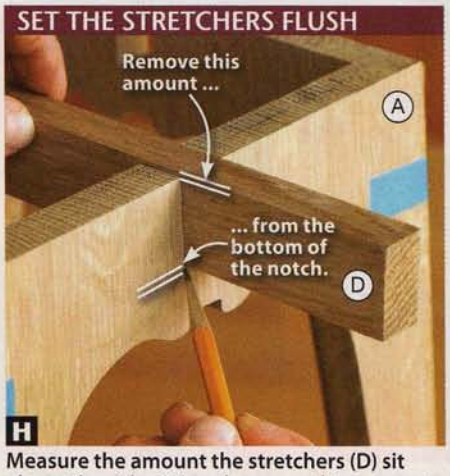
TAPE GRABS WHERE CLAMPS CAN'T

Clamp across corners of the opening where possible. Stretch strapping tape around corners where clamps won't reach.

CUT HALF-LAPS, FLIP BY FLIP

To cut centered half-laps, make a pass with each end starting against a stopblock. Move the fence as needed to widen the notch.

SET THE STRETCHERS FLUSH



Measure the amount the stretchers (D) sit above the sides (A) and remove this amount from the bottom of the notch.

DRILL SCREW HOLES

Drill countersunk shank holes through the notches in the sides (A) and drive #8x1¼" flathead wood screws into the stretchers (D).

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Wall Shelf & Towel Rack

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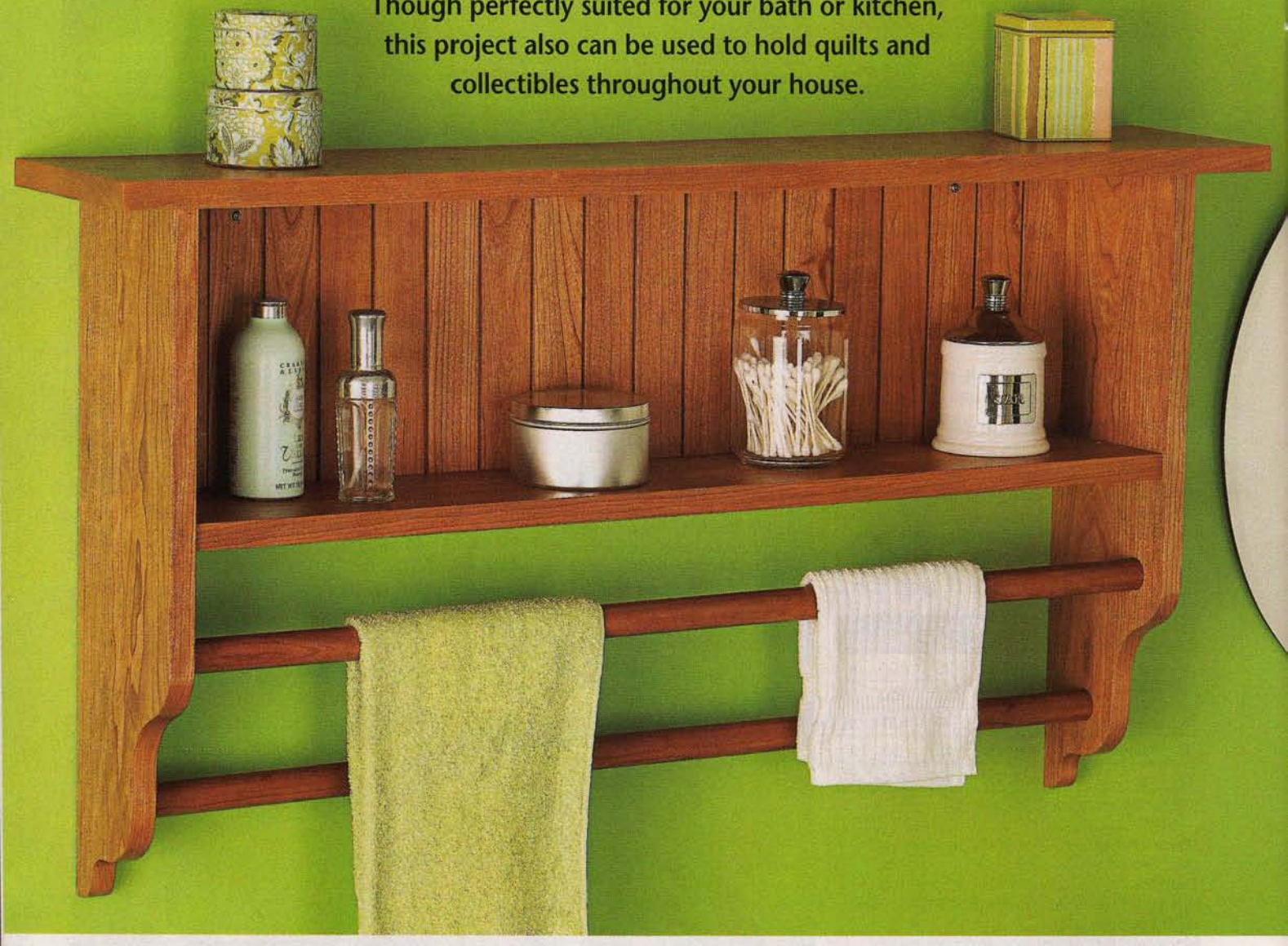
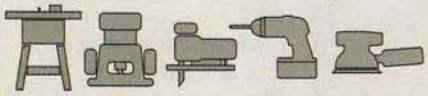


WHAT YOU'LL NEED



- **Materials:** ¾" cherry, ¼" cherry (or a beadboard panel), two 1" birch dowels.
- **Blades and Bits:** 1" Forstner bit, ¼" rabbeting bit, ⅜" straight bit, optional ⅜" countersink/counterbore bit.

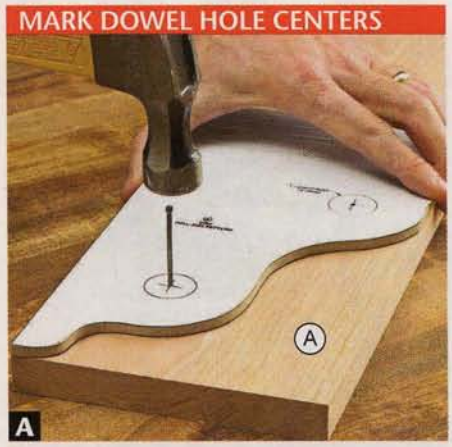
Don't let the curving shapes and precisely positioned towel bars fool you. Using only simple tools, readily available supplies from your local home center, and the tips we provide, you'll have this project ready to hang in a weekend.

Start by cutting the parts

1 Cut the sides (A), shelf (B), and top (C) to size [**Materials List**, *page 37*].

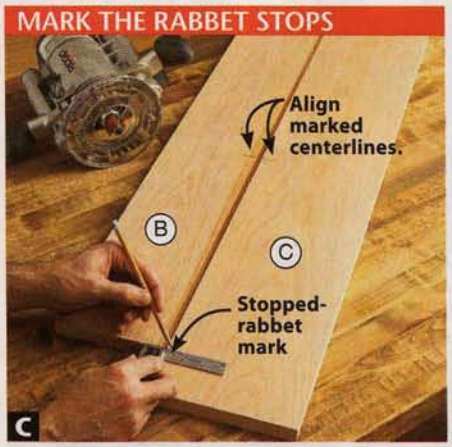
2 Copy the **Shelf Side Pattern** in the *WOOD Patterns®* insert. Mount it to ¼" hardboard with spray adhesive, jigsaw to shape, and sand the edges smooth to create a template. Then drill a ⅛" hole through each hole center.

3 Lay the hardboard template on a side (A), with the back edges and bottom ends flush. Trace the template onto the side. Lightly hammer a 6d finish nail through each ⅛" hole to mark the dowel

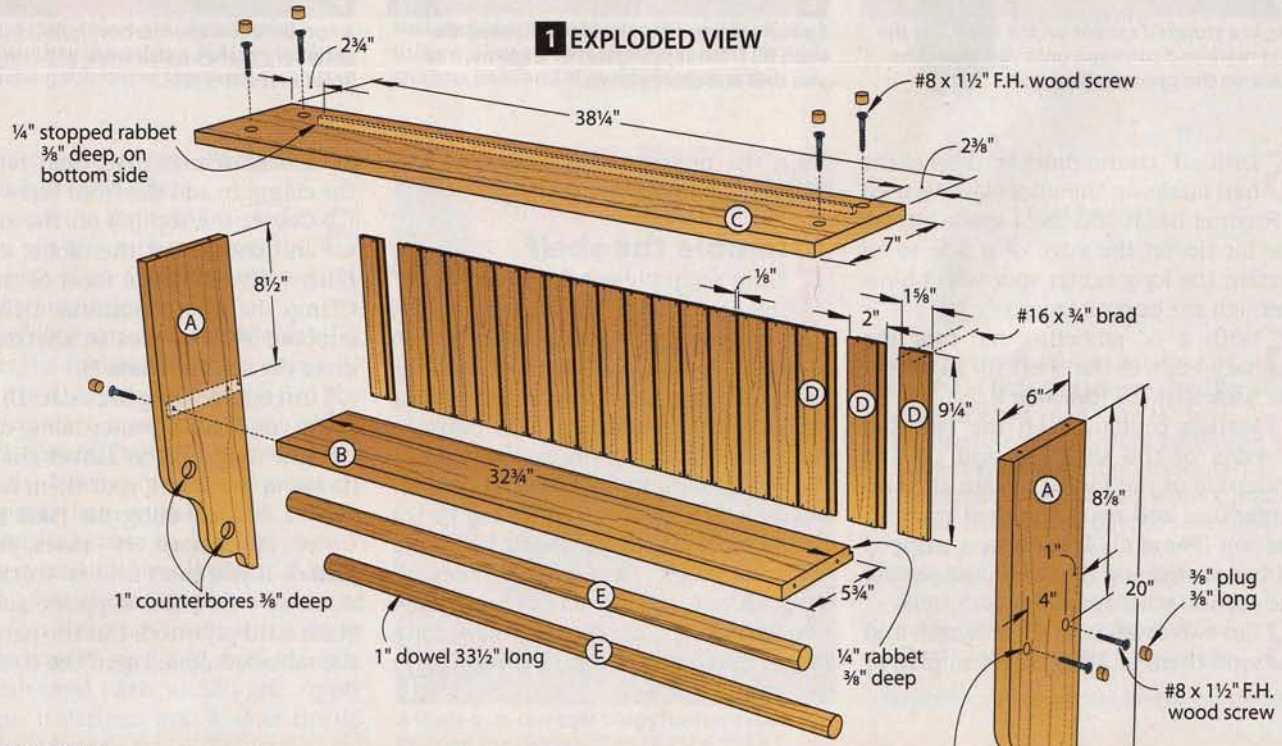


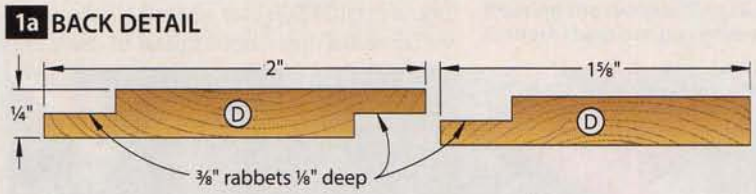
The few minutes spent creating a template make it possible to create identical, mirrored sides (A) with precisely aligned counterbores.

Jigsaw the sides (A) just to the waste side of the line you traced to minimize sanding to the line.



Instead of measuring, use the shelf (B) itself to lay out the stopped rabbet on the underside of the top (C).





hole centerpoints [**Photo A**]. Place the template, pattern down, on the other side and repeat.

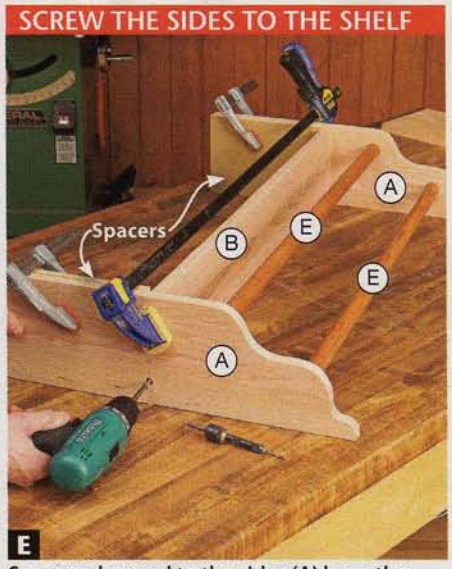
4 Jigsaw the sides (A) to shape [**Photo B**]. (See the **Shop Tip** *right* to choose the best blade.) Then sand the profile smooth to the line. (To speed the sanding process, use the drill-powered drum sander on page 20 of issue 185. Download free plans to build this jig at woodmagazine.com/drillsand. Then go to woodmagazine.com/drillsanding for a free video on using the drum sander.)

SHOP TIP

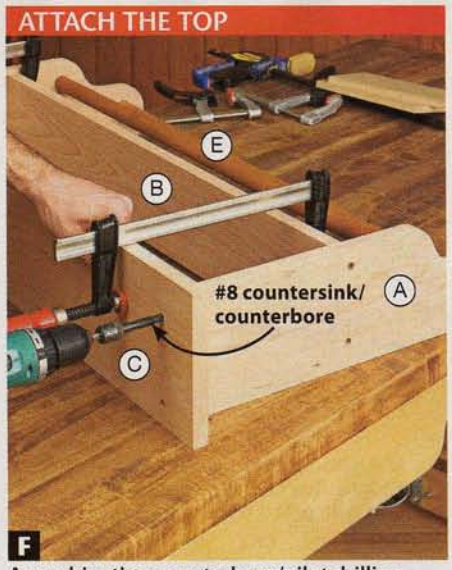
Pick the right jigsaw blade

As a versatile tool, jigsaws will cut through anything from ceramic tile to brass rods, depending on your choice of blade. For clean cuts on gentle curves in hardwood lumber, outfit your jigsaw with a 20-tooth-per-inch (tpi) blade, like the one shown. The blade's narrow body also helps you cut tight curves without binding.

Begin a stopped rabbet on the top (C) at the first mark and continue until you reach the mark on the opposite end.



Spacers clamped to the sides (A) keep the shelf (B) from slipping out of alignment as you drill and drive screws.



A combination counterbore/pilot drilling accessory makes quick work of boring screw holes in the top (C).

5 Drill a 1" counterbore ⅜" deep at the nail marks on the sides (A). (We used a Forstner bit. If you use a spade bit, lay the bit tip on the edge of a side to be certain the long center spur won't blow through the opposite face.)

6 With a ¼" rabbeting bit, rout the back edge of the shelf (B) to accept the back slats (D) [**Drawing 1**].

7 Mark a centerline on the rabbeted edge of the shelf (B) and on the underside of the top (C). Align the two centerlines and mark the shelf ends on the top [**Photo C**]. Then rout a stopped rabbet on the top [**Photo D**] and square the corners with a chisel.

8 Cut two towel bars (E) to length and sand them to 220 grit. If you plan to stain the project, stain the towel bars before assembling the shelf.

Assemble the shelf

1 From scrap plywood, cut two 6×8½" spacers. Clamp the spacers to the sides (A) with the edges and ends flush [**Photo E**]. Place the shelf (B) between the sides with the rabbet to the back facing up. Mount the towel bars (E) between the sides, and clamp the assembly.

2 Drill counterbored shank holes for the shelf (B) screws [**Drawing 1**]. For the #8 screws, drill 5/32" shank holes and 7/64" pilot holes. Drill counterbores ⅜" deep. (See "Cover up screws with these two accessories" on the next page for a pair of time-saving tools.) Drill and drive both back screws first, then reposition the clamp to add the front screws.

3 Center the top (C) on the sides (A), and check that the rabbet ends are flush with the inside faces of the sides. Clamp the top in position. Drill counterbored shank holes in the top; then drive the screws [**Photo F**].

4 Cut ten 20"-long back slat (D) blanks. If you have a router table, use a ⅜" straight router bit to rabbet the blanks [**Drawing 1a**]. If not, rout them freehand with a ⅜" rabbeting bit [**Skill Builder**]. ***Quick tip! Swap 19 slats for one panel.*** If you can't find ¼"-thick cherry stock at your local supplier, substitute beadboard plywood. Cut the panel to fit the rabbeted opening in the back, stain

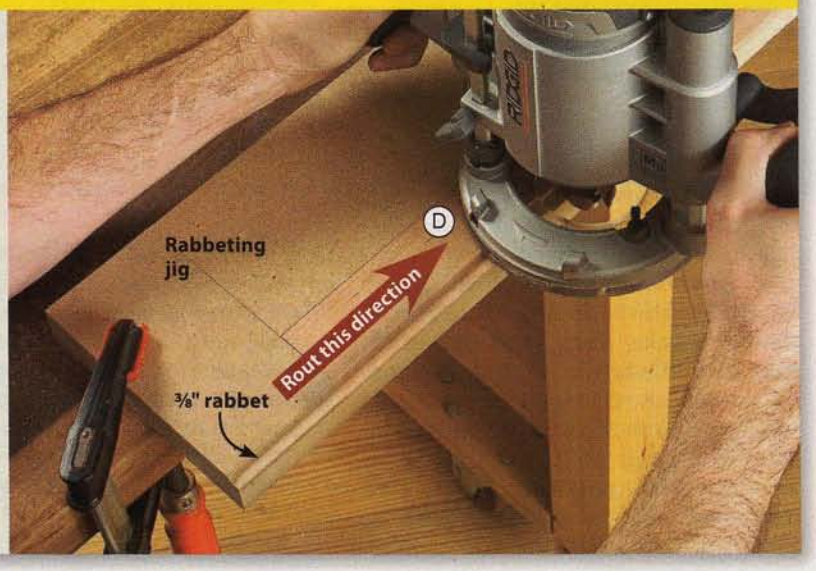
SKILL BUILDER

Rout quick, safe rabbets with this simple jig

Guiding a handheld router along 2"-wide parts to cut 20 rabbets in 10 blanks can turn into a dicey balancing act. However, this simple jig makes repetitive routing a breeze.

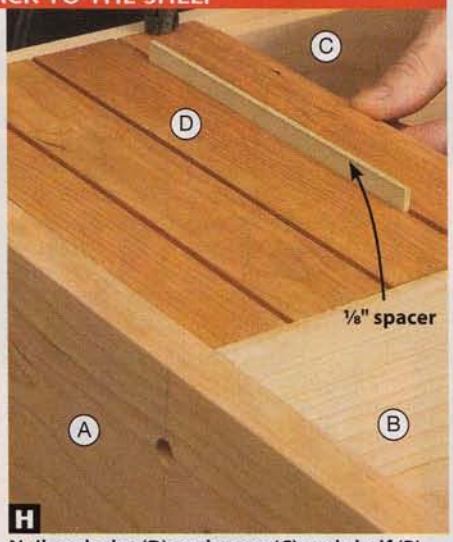
Begin with a ¾×6×28" MDF base. Then add three ¼"-thick MDF pieces—a 4×20" piece beside the workpiece and 4×6" pieces at either end—to capture the back slat (D) blank and support the router base.

Insert a blank into the jig recess. Starting at the left end of the jig, rabbet the jig and blank edges, as shown at *right*. Then turn the blank upside down, and rout a second rabbet. Repeat for the other blanks.



TWO TECHNIQUES FOR ADDING A BACK TO THE SHELF

G Cherry gel stain colors pine beadboard plywood without blotching. Nail the back on after finishing the rest of the shelf.



H Nail each slat (D) to the top (C) and shelf (B) using a ⅛" spacer to separate them. This adds shadow lines and allows for expansion.

it to match the cherry [**Photo G**], and attach it with ¾" brads.

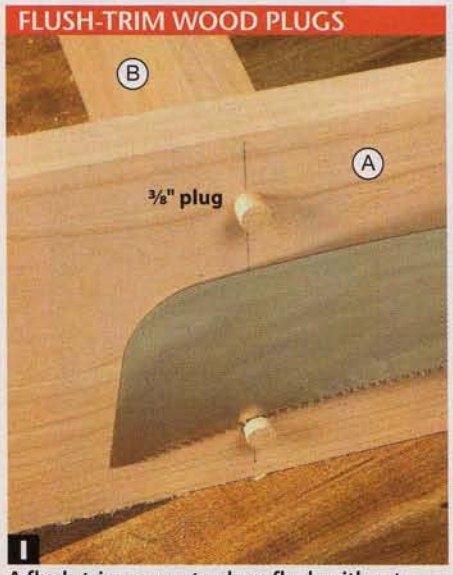
5 Crosscut the back slats (D) to length, then rip the rabbeted edge off the two outside slats. Sand the slats to 220 grit and stain, if desired.

6 Attach one narrower outside slat (D), with the rabbeted edge up, using ¾" brads. Then attach two-thirds of the remaining slats, separating them with a ⅛"-thick spacer [**Photo H**]. (A crafts stick will work.) When you get to the last six slats, space them evenly apart within the remaining space and nail in place.

7 Buy or make ⅜" wood plugs ½" long, and glue them in place over the screws. Cut the plugs flush with a sharp chisel or saw [**Photo I**] and sand smooth.

8 Finish-sand parts to 220 grit. Apply stain, if desired, and a clear finish. (We used Minwax no. 607 Cherrywood gel stain to lessen blotching, followed by two coats of wipe-on polyurethane.)

FLUSH-TRIM WOOD PLUGS



I A flush-trim saw cuts plugs flush without marring the surrounding surface. Then smooth them during finish-sanding.

Written by **Bob Wilson** with **Kevin Boyle**
Project design: **Roger Keindel**
Illustrations: **Roxanne LeMoine**; **Lorna Johnson**

Cover up screws with these two accessories

Countersink/ counterbore

Plug cutter

Two low-cost drilling accessories help you hide the screws used to assemble this shelf. The ⅜" countersink/counterbore bit (see **Sources**) drills a counterbore, a countersink for flathead screws, and a pilot hole in one pass to save time and increase accuracy.

To fill the counterbore, make plugs in scrap using a plug cutter made for use in handheld drills. Then saw or pry the plugs loose.

Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
A	sides	¾"	6"	20"	C	2
B	shelf	¾"	5¾"	32¾"	C	1
C	top	¾"	7"	38¼"	C	1
D*	back slats	¼"	2"	9¼"	C	19
E	towel bars	1" diam.		33½"	B**	2

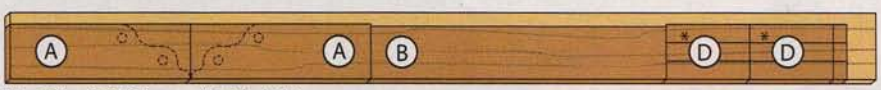
*Parts initially cut oversize. See instructions.
**Use cherry dowels if available.

Materials key: C–cherry, B–birch
Supplies: #8x1½" flathead wood screws, #16x¾" brads.
Bits: ⅜" straight bit, ¼" rabbeting bit, 1" Forstner bit.

Sources

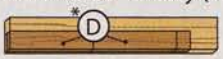
Countersink/counterbore bit: #8 countersink no. 50J04.08, $7.80, Lee Valley, 800-871-8158 or leevalley.com.
Plug cutter: Self-centering ⅜"-diameter plug cutter no. MBT-0375, $16.05, McFeely's, 800-443-7937 or mcfeelys.com.

Cutting Diagram



¾ x 7¼ x 96" Cherry (5.3 bd. ft.)
*Plane or resaw to the thickness listed in the Materials List.

¾ x 7¼ x 96" Cherry (5.3 bd. ft.)



¾ x 3½ x 24" Cherry (.7 bd. ft.)

1" diam. x 36" Cherry dowel (2 needed)

Norm: America's Woodworker

In his third decade on TV, Norm Abram continues to educate millions of PBS viewers about woodworking and home remodeling. We visited his Boston workshop to get an inside look at the man and share in his best pearls of woodworking wisdom.

Watch FREE videos of our visit with Norm Abram at: woodmagazine.com/videos

He's the Elvis of woodworking. And, like Elvis, the world is on a first-name basis with him. Instantly recognizable with his plaid shirt and beard, Norm Abram carries the torch as today's biggest woodworking celebrity. At public appearances, people stand in line for hours to meet Norm and get his autograph or photo. Everyone turns to look when he enters the room.

But get outside the scope of woodworking and Norm is just a regular guy going about his business. And despite the fame of a television career, he's friendly, modest, and accommodating. He just happens to make his living in front of a TV camera.

"The two shows [*The New Yankee Workshop* and *This Old House*, both on PBS] have been really good to me," Norm says with a sheepish grin, as though he doesn't deserve the adulation. "I have no desire to be a big celebrity. I enjoy what I do, but I also enjoy my privacy."

A star is discovered in the barn

Thirty years ago, television producer Russ Morash hired Norm, then a private contractor, to build a barn for him. "He impressed me with his quality work and small scrap pile," Morash recalls. When he finished, Morash offered him a role on *This Old House*, a new show that focused on restoring old homes.

"But we didn't just throw him into the show because he had never been on TV before," Morash says. "The host would ask him questions and he'd answer. He was—and still is—so credible and believable and honest."

"When I first started with *This Old House*, it was scary," Norm remembers. "But I quickly learned that if I just did what I knew and stopped worrying about the camera that I would be okay. I'm still amazed that I've made a career out of what I enjoy doing."

Soon Morash had another idea. "We were building a lot of nice things in the shop rather than on-site," he says, "and one day I asked Norm if he could build furniture for a TV show. The public loved it right away." Russ and Norm thought this new show about woodworking might last for three or four years. Little did they know.

"The secret to *The New Yankee Workshop*, right from the start, is we build real, practical projects that people like," Norm says.

Glad to be in plaid

To help build the show's identity, Morash urged Norm to develop a look. "When the show started, Russ said 'Wear plaid shirts, they're good for the camera.' That automatically became my trademark. But by and large, beyond television, I don't wear them very frequently. One thing about television, once you create a character it's hard to jump out of it. If I wanted to become anonymous I'd shave my beard and wear a solid color shirt and probably go around unnoticed. But now it's part of who I am."

As is his well-worn leather carpenter's tool belt. And don't forget Norm's message about shop safety—most viewers know it by heart—that precedes the use of power tools on every project. The American Academy of Opthalmology recently honored Norm for promoting the use of safety glasses.

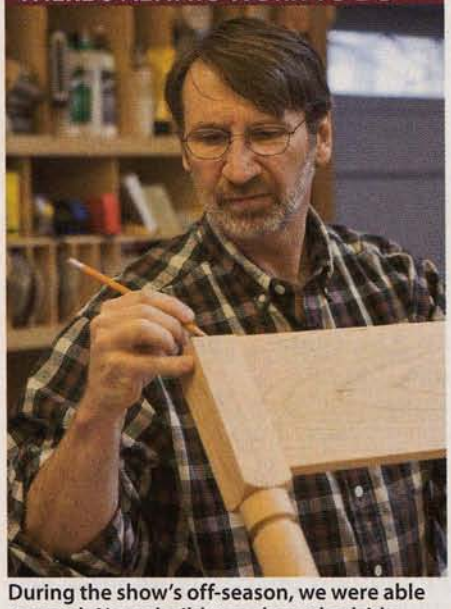
"I'm still amazed that I've made a career out of what I enjoy doing."

Norm answers his critics

To be fair, Norm has his detractors. Some say he builds furniture like a carpenter, citing his regular use of pneumatic nailers. Norm admits his roots developed in carpentry, but also recognizes the progress he's made as a furnituremaker.

"Certainly my skill level is much higher than when I first started *The New*

THERE'S ALWAYS WORK TO DO



During the show's off-season, we were able to watch Norm build two cherry bedside tables for his home.

Norm at a glance

Norm searches for the best color and grain match for a cherry bedside table.

Age: 59
Family: Wife (Elise), 1 daughter, 1 stepson
Hometown: Milford, Mass.
Education: University of Massachusetts (mechanical engineering & production management)
Work history before TV: Construction worker, self-employed general contractor
First appearance on *This Old House*: 1979
First episode of *The New Yankee Workshop*: 1988
First woodworking tool: Handy Andy child's tool kit
First piece of furniture I built: A bookcase for college when I was 17 years old
Professional influences: My father, who was a carpenter
Toughest woodworking skills I've learned: Carving, gilding
Hobbies outside woodworking and carpentry: Boating, fishing, travel, cooking

Norm's Favorites:

Furniture style: Shaker, Early American, Arts and Crafts
Wood species: Cherry, mahogany
Furniture finishes: Tung oil, wipe-on polyurethane
Hand planes: Low-angle block plane, shoulder plane
Car: 1948 Ford coupe that I restored
Sports teams: All Boston teams
TV show (that I'm not in): *The Sopranos*
Vacation spot: Off the beaten path, preferably on or near the water

"I've always enjoyed what I do. I'm always going to be doing something that revolves around building or woodworking, maybe teaching, maybe learning some more."

Yankee Workshop," he says. "There are many craftsmen out there who are better than I am. I see myself as a fairly ordinary woodworker. Like any craftsman, you want to take some of your early pieces and throw them in the fireplace; you don't want anyone to see them. But it's your history. It shows how you've progressed at your craft."

And the brads? Norm points out that there are more nails in furniture than most people want to admit. "When you look at antiques that are a hundred or more years old, they've got a lot of cut nails in them. I think there's a place for them that's not offensive or violates a craftsman's work."

Norm considers his future

After 20 years and hundreds of projects on *The New Yankee Workshop*, what's next for Norm? "My wife says I'm never going to retire," he chuckles. "She likes to joke that I can't walk across the room without accomplishing something along the way. And I've always enjoyed what I do. I know I'm always going to be doing something that revolves around building or woodworking, maybe teaching, maybe learning some more. I know I don't want to be a pitchman, go out and sell product."

When asked to ponder his legacy, Norm pauses to consider, as though he's never thought about it before. "I think it's going to be less about what I built and more about what I taught or inspired people to do. I'd like to be thought of as the guy who did a TV show about woodworking, got people of all ages interested in woodworking, and brought them a lot of enjoyment."

HE'S A LEG MAN

Calling his lathe skills "good enough," Norm says he won't shy away from a project just because it might have turned elements.

10 Things You Might Not Know About *The New Yankee Workshop*

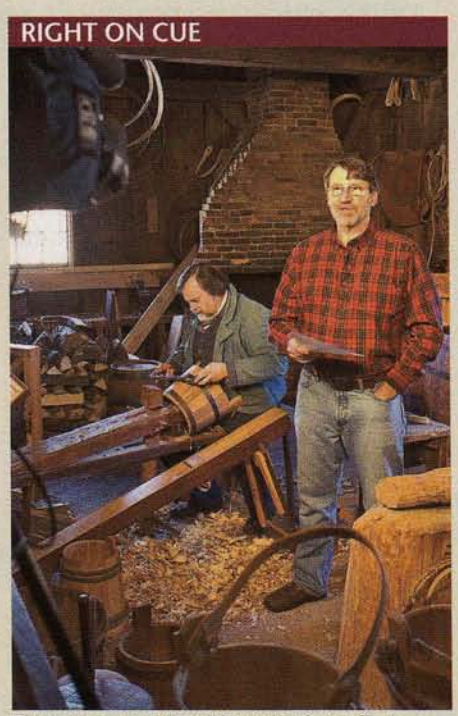
1. Norm designs and builds each project. He does get some help, though, from shop assistant Wade Burcher, who maintains the tools, shop, and grounds, as well as applying subsequent coats of finish to projects off-camera.

2. One for you, and one for me. Norm builds two of each project, and no more. He keeps one and producer Russ Morash gets the other. Occasionally, they donate one of the pieces to charity.

3. It really is a two-day show. When Norm says "Well, good morning!" about midway through a show, it actually does signal the start of a second day. They tape half the show one day, skip a day, and then come back and finish. "I like a day off in between tapings so I can make any adjustments," he says.

4. Norm does not promote tools on the show. Yes, most of the tools in *The New Yankee Workshop* come from the show's major underwriters, Delta and Porter-Cable, but PBS rules requiire all brand names to be masked over. "I might recommend a type of tool for a job, but never a particular brand. If I use a tool on the show it means it works well and I like it," Norm says.

5. (Gasp!) Norm *does* make mistakes. Prior to taping an edisode, Norm spends days fine-tuning his designs and techniques to work out any bugs. "When it comes time to produce the TV show, I know exactly what I'm going to do."



RIGHT ON CUE

During our visit to Old Sturbridge Village, Norm recorded a promotional spot for a local PBS television station.

6. Norm's not just a power-tool guy. It only seems that way because he's trying to appeal to a mass audience, most of whom use power tools. In reality, he uses a low-angle block plane and shoulder plane on nearly every project, though they seldom make the cut for the show.

7. Time demands a few concessions. For example, Norm has an industrial-sized, wide-belt sander in the shop, but you never see him use it. "We use tools that our viewers have," he explains, "but we work on a production schedule and there are deadlines to meet. It helps me do that."

8. He doesn't live in the past. Norm regularly uses a cell phone, digital camera, iPod, and laptop computer. He uses the Internet, as well, for research and shopping.

9. No sponsors, no show. Two underwriters withdrew their support after the 2008 season, leaving only longtime supporters Delta and Porter-Cable for 2009. "If they left we'd have to find another major sponsor or get PBS funding, but that's hard to come by. Otherwise, we'd be done. It's always a good day when Russ says 'We've got underwriting for another year'."

10. The camera adds square footage. Because of wide-angle camera lenses, the New Yankee Workshop appears larger than it is. In reality, the working part of the shop measures 26x36', about the size of a three-car garage. It's half of a two-story barn that Norm built, but he uses the other half for finishing projects, office space, and storage for tools and accessories. Norm moves most machines around on mobile bases for filming each show.

Benefiting from furniture designs of the past

From its inception, Norm Abram and Producer Russ Morash grounded *The New Yankee Workshop* in a foundation of traditional furniture styles. At the beginning of each episode, Norm visits a museum or historical site to see a particular piece of furniture crafted long ago. He takes measurements and photos of the piece, then goes back to his Boston shop and builds a similar version.

"I'm drawn to functional furniture and less to something for art's sake," says Norm. "I look for good proportions, and ask 'What's different about this than the other projects we've done before? What haven't we shown people before that we could teach them?' And we want something that our viewers want to build."

Going back to the roots

One of Norm's go-to spots for project ideas is Old Sturbridge Village, a living-history 1830s settlement in Sturbridge, Mass. Norm has built six *New Yankee* projects based on pieces he discovered there, including the butterfly table shown at *right*.

"We're grateful to museums and places like Sturbridge for allowing us to come in and film these projects," he says. "Places like these are our heritage and our resources for discovering the history of furnituremaking and so much more.

"To me the anonymous craftsman [of a bygone era] is the ultimate inspiration because the work that he's left behind all these years later speaks for itself. [The pieces are] well-made, and they were made without the tools we have today."

So what does he look for, and how does he start after choosing a piece? "One of the things I love about looking at an antique is the proportions. The old pieces of furniture just feel right. And I'm not so much interested in making exact replicas as making a piece inspired by it. When you're looking at antiques, allow yourself the freedom to make slight changes and adapt the design to your own needs."

Norm's reproduction tips

■ If you're interested in reproducing an antique, Norm suggests you bring along a tape measure (standard and fabric), a 6" square, tracing paper, graph-paper sketch book or notebook, and a digital camera or video camera.

"The digital camera has become a very valuable tool when you're trying to document an old piece of furniture. With any camera you have to be careful of the angle you shoot because any distortion could alter the dimensions or proportions of your project."

Norm traces any curves or unusual shapes when he can. With turned features he takes precise measurements of diameters and spacing. "Sometimes I just hold my tape next to a leg and shoot a photo or video of it, and then figure out the measurements back in the shop. It's not critical to get each dimension to the 32nd of an inch; it's the proportions that I'm looking for."

■ Always ask permission from the owner or museum staff before approaching the piece. They might provide you with dimensions or other pertinent details.

■ If you can't get close to the piece, take photos from multiple angles. Then use nearby objects, such as floorboards, electrical outlets, or stairs, to determine scale. "Guess at the approximate dimensions," he says, "and use your photos to maintain the proportions. You really only need a few dimensions to get started."

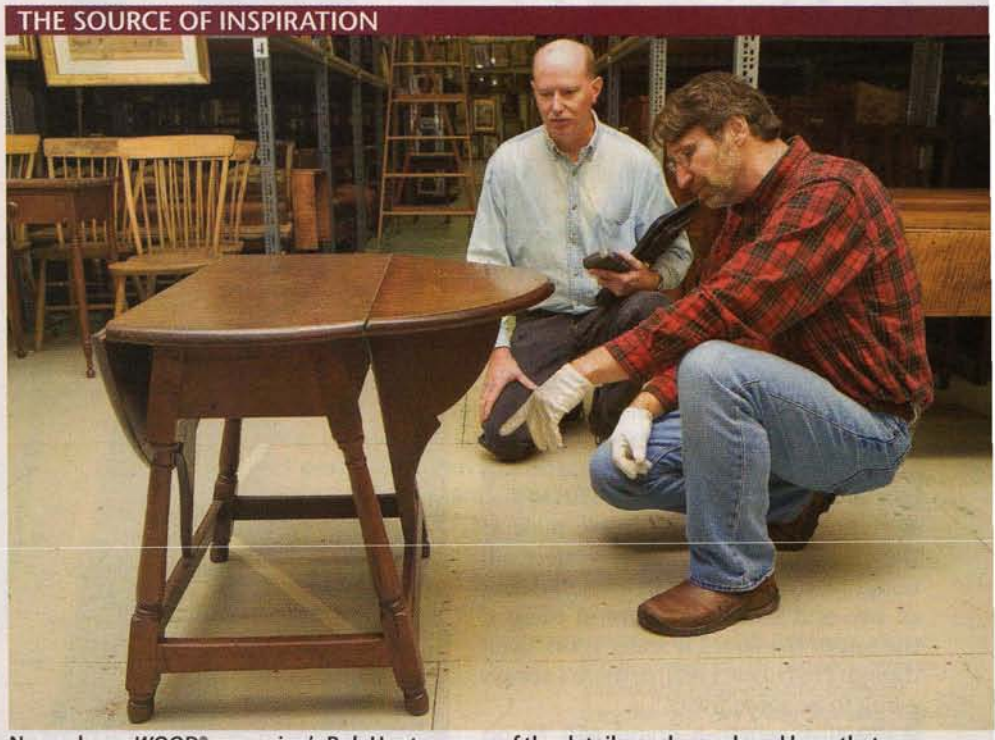
■ To determine an approximate angle—splayed legs on a table, for example—shoot photos of the square standing next to the angled element. Then estimate the angle back in your shop.

■ If possible, shoot photos of hard-to-see areas for details, as shown *below*.

■ Draw details on graph paper to help you maintain proportion. You can also enlarge photos for full-size patterns.

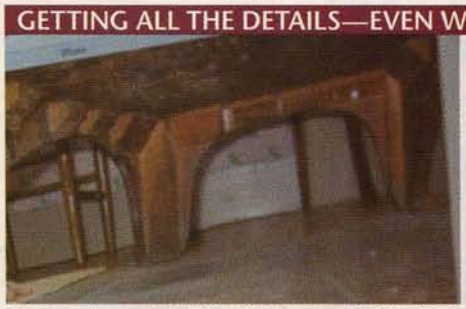
> *"It's not critical to get each dimension to the 32nd of an inch; it's the proportions that I'm looking for."*

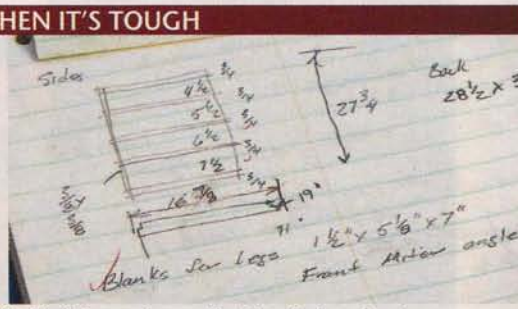
THE SOURCE OF INSPIRATION



Norm shows *WOOD*® magazine's Bob Hunter some of the details, such as splayed legs, that fascinated him about this butterfly table at Old Sturbridge Village.

GETTING ALL THE DETAILS—EVEN WHEN IT'S TOUGH





Because he couldn't tip it, Norm took this photo (*left*) of the underneath side of a bowfront chest to see the joinery. He also records detailed notes and dimensions (*right*) for each project.

Norm's laws for buying and using lumber

Nearly four decades of working with wood have taught Norm truths that apply to most wood-selection scenarios:

■ Norm typically buys only the wood he needs for a specific project, most often from a local hardwood dealer that lets him sort through the stacks for choice pieces.

"Don't spend a lot of money on a board that's longer than you need," he says. "But if you find a really spectacular piece, even though you might not need it right then, buy it because those boards can be hard to find."

■ "The biggest mistake people make is they want every board to be perfect. I'll take a piece of wood with a small defect or two and then work around them if the rest of the board is really good. Even though I'm frugal, I realize there's always going to be some waste."

■ Visualize where a board will fit on your project. If you need to create matching parts, get them from a single board.

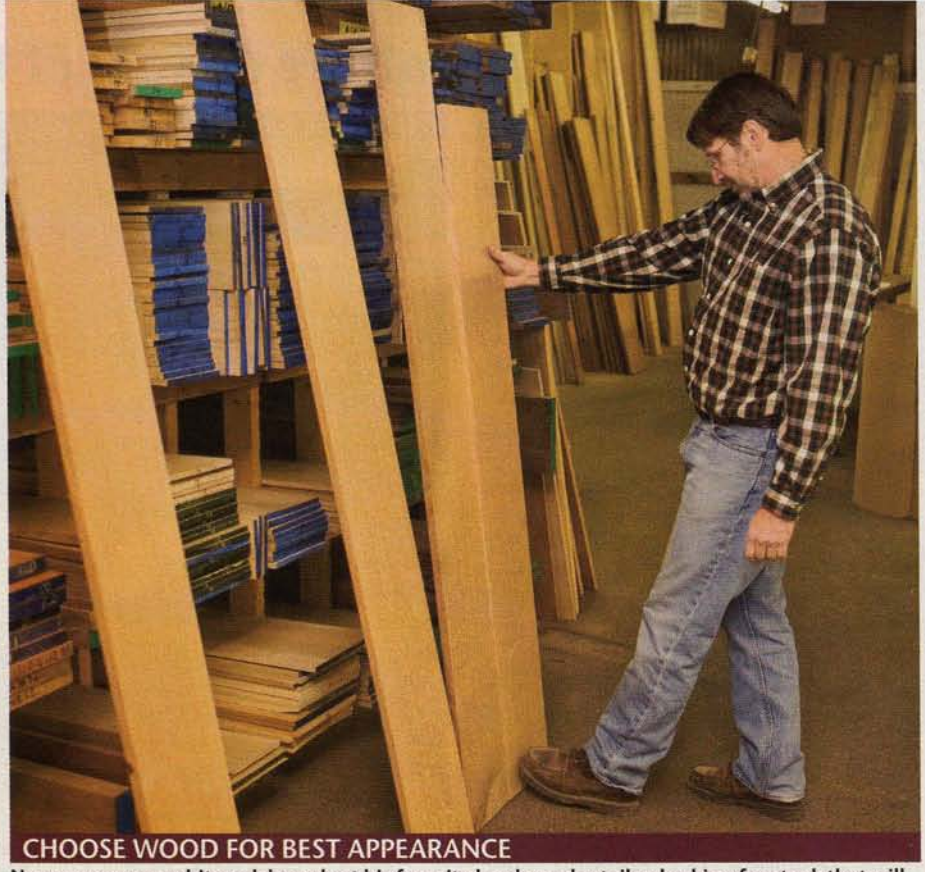
■ Don't begin working the wood as soon as you get it in your shop. Instead, let it sit for a few days to equalize its moisture content with that of your shop.

"The biggest mistake people make is they want every board to be perfect."

■ When edge-gluing tabletops and wide panels, match the color and grain of the face that will show. Forget about the orientation of end-grain growth rings.

■ Look at both faces of a board, because one might look much different than the other. You can often hide a lesser-quality face inside a project.

■ Avoid warped boards entirely: You'll waste too much material machining them to size or get only small workpieces from them.



CHOOSE WOOD FOR BEST APPEARANCE

Norm compares white oak boards at his favorite hardwood retailer, looking for stock that will match nicely for a tabletop.

■ To maximize prized figured wood, resaw it into thinner pieces and laminate them onto less-expensive stock.

■ If possible, get your hands on old, recycled lumber. "Not only is it good environmentally, but there's a lot of character in that wood," Norm says. "And if it's truly old-growth timber, then it's going to have really tight growth rings, so it'll be more stable even if a board is two feet wide."

■ To find old-growth timber, look for buildings being torn down, or simply falling down, and ask the owner or contractor if you can help dispose of the boards. Old barns, warehouses, and docks are good sources.

"We love to get hold of old attic floor boards. They're typically a pretty decent pine with tight growth rings, they don't have a lot of wear, and they're probably not heavily nailed."

■ Norm cautions that the yield is typically pretty low with reclaimed wood. It takes more time and muscle to get the lumber into a workable state as compared to new stock. "You have to be careful or you can damage your tools. Expect to find a lot of nails, loose knots, grit, and dirt. Even rust left from a nail can dull planer knives or saw blades."

■ Invest in a metal detector (about $100 to $200) to find metal you can't see.

■ When cleaning recycled lumber, avoid bending any cut nails, which can break off in the wood.

■ Sand old boards with a portable belt sander to remove surface debris and expose obscured nails. An exposed nail could tear costly drum-sander belts.

■ Saw off the ends and edges of reclaimed stock with a blade you're willing to sacrifice. There's likely grit embedded in those areas.

■ Likewise, use an old set of planer and jointer knives for cleaning old stock. Install new knives to machine the wood to final dimensions.

■ Norm likes to leave nail holes and defects in the wood for character rather than filling or patching them. "What's the sense of using reclaimed lumber and not showing part of its history?"

BEWARE OF HIDDEN NAILS

Nails or other metal can be difficult to find at first sight. This oak 4×4 looked nail-free, until cleaned off with a belt sander. That's when a broken-off nail showed up.

Written by **Bob Hunter**
Photographs by **Bryan McKay**

Better Homes and Gardens®

WOOD® PATTERNS®

September 2009 *Issue 192*

Dear Reader: As a service to you, we've included full-size patterns on this insert for irregular shaped and intricate project parts. You can machine all other project parts using the Materials List and the drawings accompanying the project you're building.

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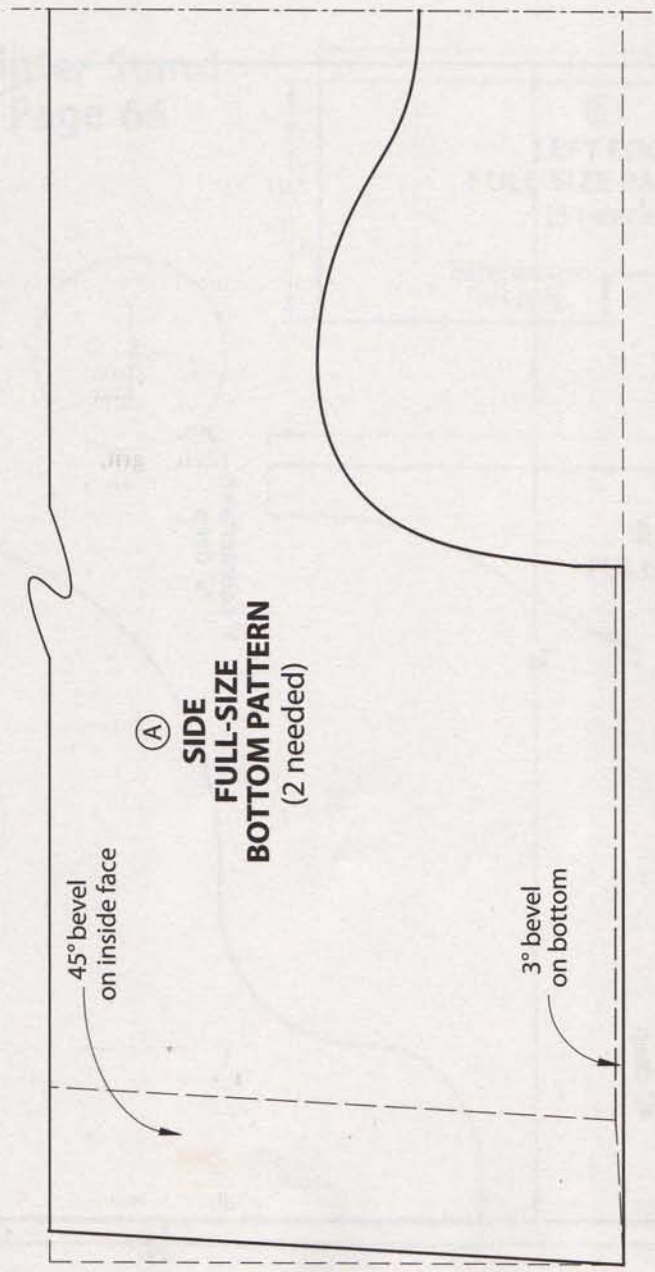
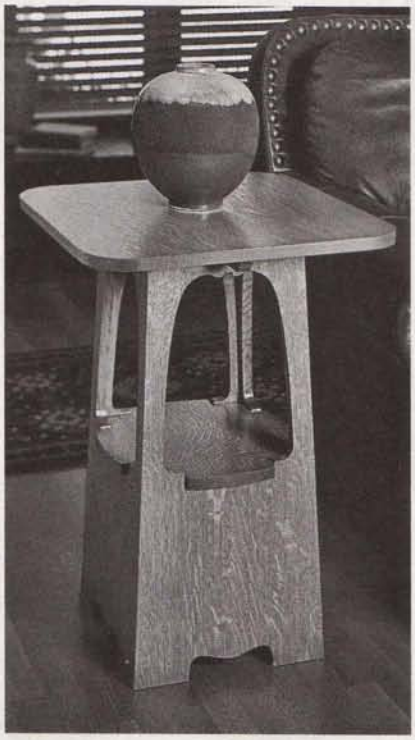
¾ x ⅝" notch in lower stretcher
¾ x ⅝" notch in upper stretcher
Ⓓ STRETCHER FULL-SIZE HALF PATTERN (4 needed)
⅜" counterbore ½" deep
3/16" shank hole, countersunk
⅜" counterbore ¼" deep



Limbert-style Arts & Crafts Table

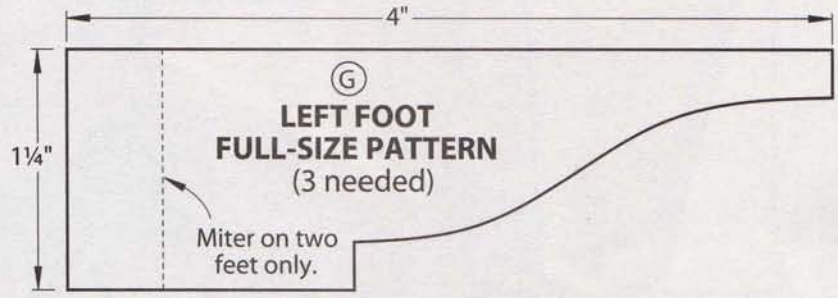
Page 30

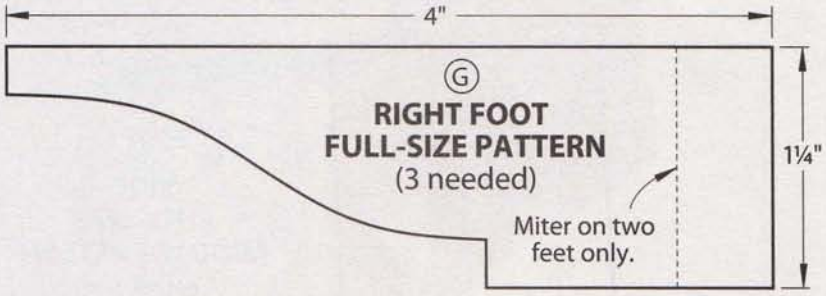


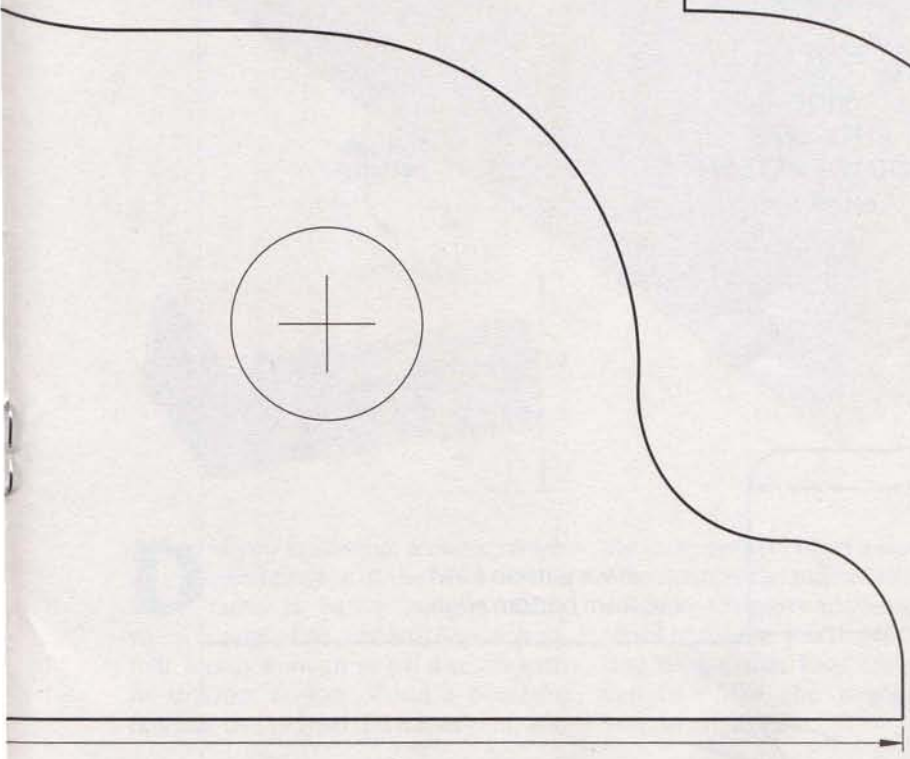
Basic-Built Wall Shelf & Towel Rack
Page 34

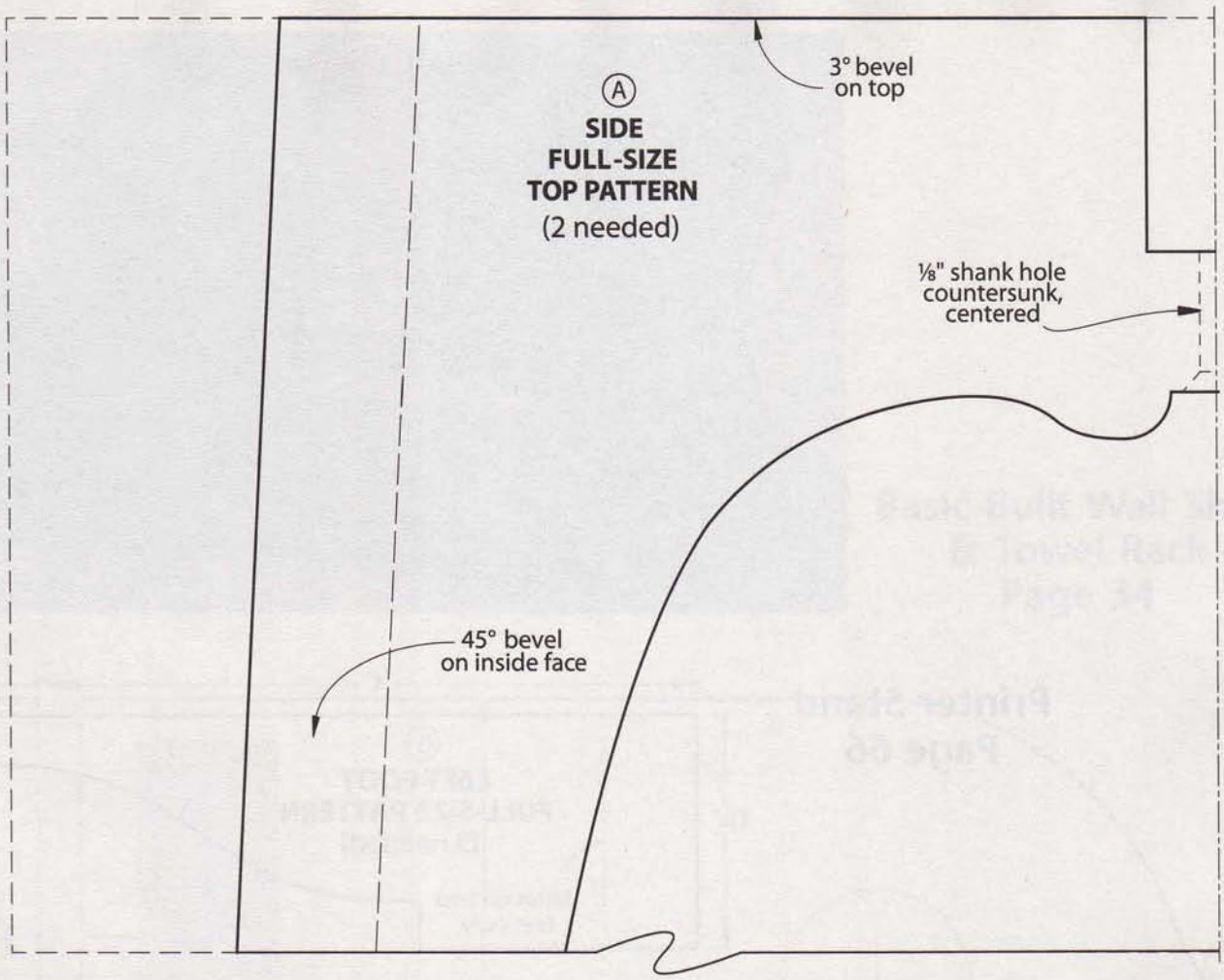
(A) SHELF SIDE
FULL-SIZE PATTERN

Printer Stand
Page 66

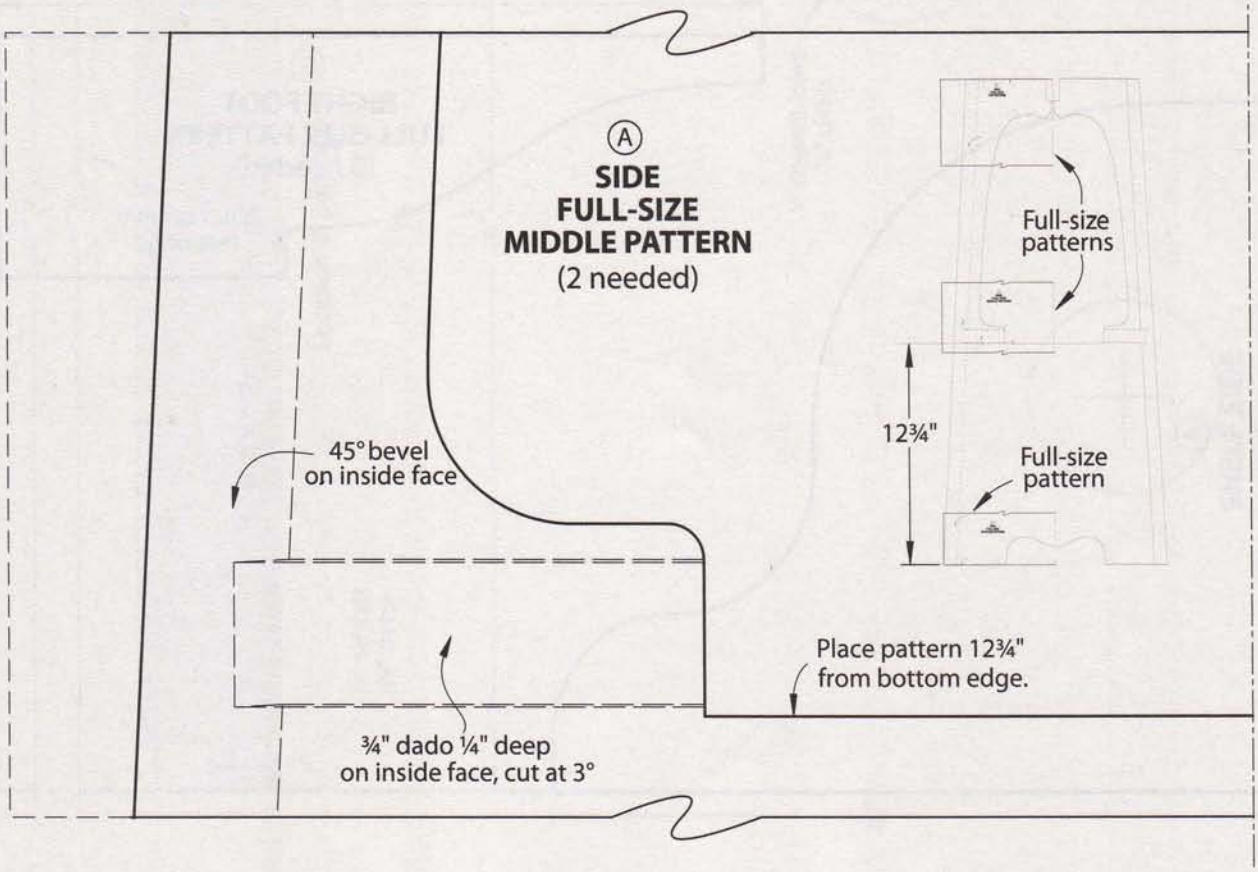








Limbert-style Arts & Crafts Table Page 30



Slant-Sided Music Box

Mahogany and maple blend harmoniously in a box as beautiful as the music within.

Did you know that a music movement playing in the palm of your hand is barely audible? Only when mounted to a board does it resonate loudly enough to fill a room with its tinkling melody. Build a beautiful box like this to hold the movement, and the lucky owner enjoys a serenade every time she lifts the figured maple lid.

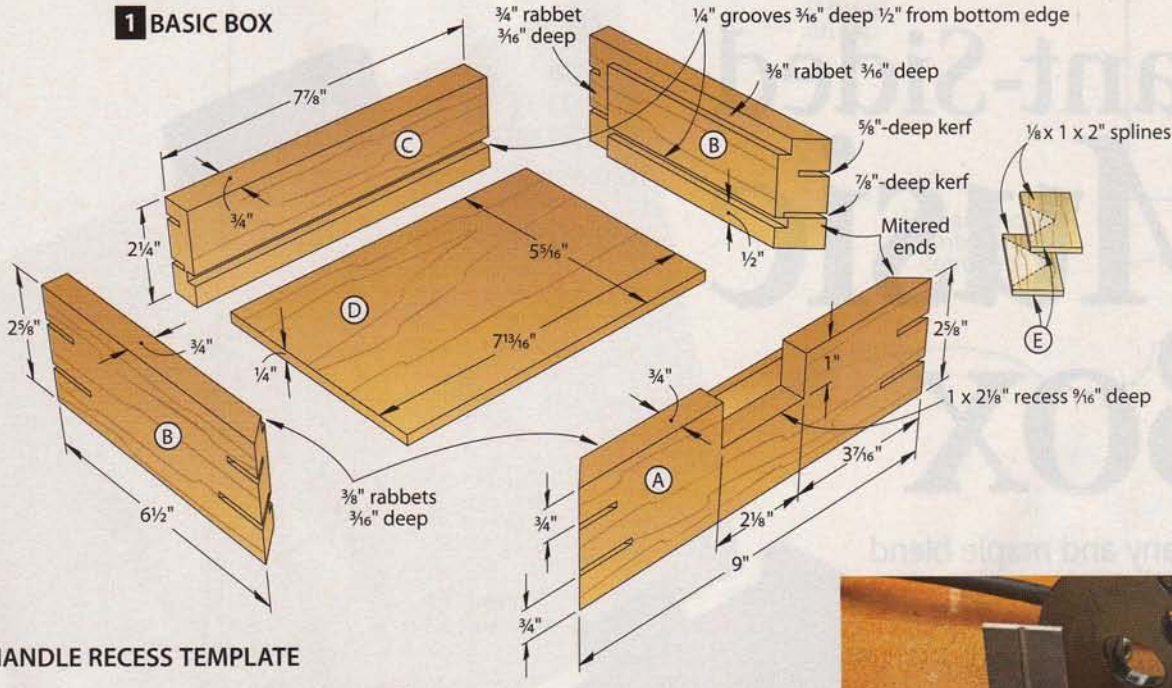
Besides the music movement, the only other hardware you'll need is a pair of stop hinges that keep the lid propped upright while the music plays. See **Sources** on *page 51*.

Compose a box

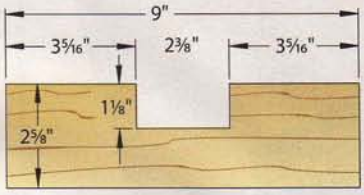
1 From ¾"-thick stock, cut a 2⅝×10" blank for the front (A) and two 2⅝×7" blanks for the sides (B).

2 Using a ½" straight bit in a table-mounted router, rout a rabbet in the back end of each side (B) [**Drawing 1**].

1 BASIC BOX



1a HANDLE RECESS TEMPLATE



PROJECT HIGHLIGHTS

- Overall dimensions: 9" wide x 6½" deep x 2⅞" high.
- Splines reinforce mitered and butt-jointed corners and provide contrasting accents.
- Open the lid to start the music and reveal the brass movement sheltered in a windowed compartment.
- Music movements come in a variety of melodies. **Sources** on *page 53* lists some choices.

3 Reset the router-table fence to rout the ⅜"-wide lid rabbet inside the top edge of the front (A) and sides (B) [**Drawings 1, 2**]. Note that the sides should be mirror images of each other.

4 Miter-cut both ends of the front (A) so the finished length is 9" [**Drawing 1**]. Miter-cut the front end of each side (B) so their final lengths are 6½".

5 Rip the back (C) to width to match the distance from the bottom edge of a side (B) to the shoulder of the lid rabbet [**Drawings 1, 2**]. To determine the length of the back, dry-fit the front (A) and sides (B), and hold the miters together with masking tape. Cut the back to length to fit between the rabbets in the sides.

6 Using a ¼" straight bit in the router table, rout a ¼" groove 3/16" deep in the front (A), sides (B), and back (C) for the bottom (D) [**Drawings 1** and **2**].

Time for recess

1 To make the recess for the lid handle (I), create a template from ½" plywood the same size as the front (A) [**Drawing 1a**]. Cut the notch out of the template, then use double-faced tape to fasten the template to the front (A) with the ends and edges flush.

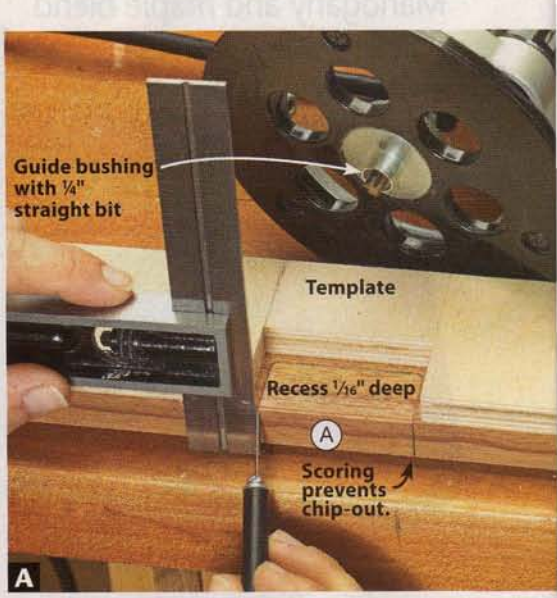
2 Chuck a ¼" straight bit into your router; then install a ½" outside-diameter guide bushing in the base.

Note: *The bit must be long enough to extend 1 1/16" below the router base.*

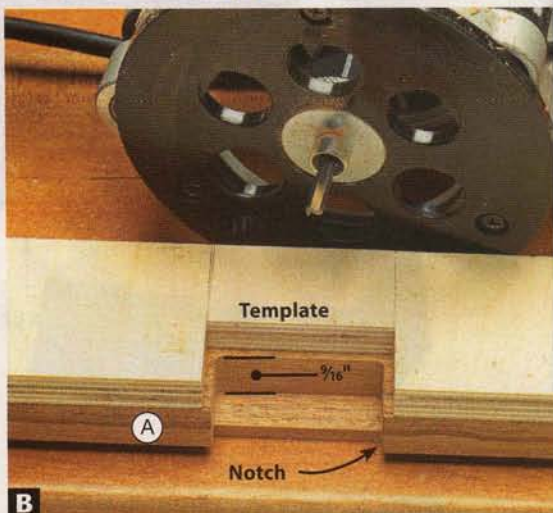
3 Place the template and front (A) assembly, template side up, on a router mat, or use double-sided tape to secure it to your bench. Set the router bit for a 1/16"-deep cut in the front (A), and rout around the template notch [**Photo A**]. Score the top edge of the front to prevent chip-out as you remove the remainder of the waste in the recess [**Photo B**]. Square up the recess corners with a chisel.

4 To determine the size of the bottom (D), dry-fit the box and measure the inside dimensions. Add 5/16" to each dimension, and cut the bottom to size from ¼" stock. Sand the inside faces of the front (A), sides (B), back (C), and bottom (D) to 220 grit.

5 Assemble the box [**Photo C**]. Do not glue the bottom (D) so that it can expand and contract freely.



A



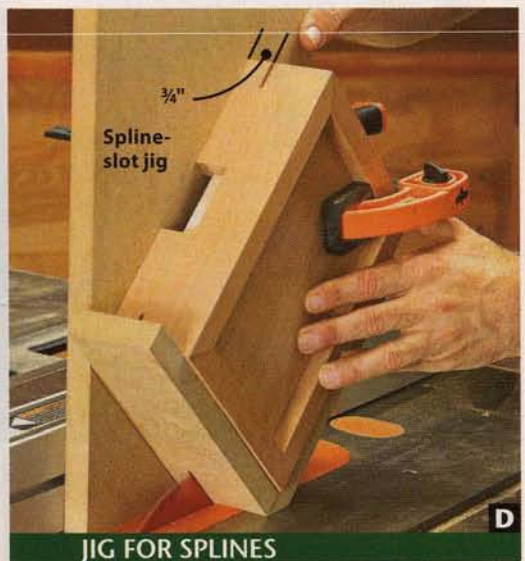
B

ROUTING THE RECESS

After routing a shallow recess, use a crafts knife to score from the edges of the recess down the top edge of the front (A). Routing a recess 9/16" deep creates a notch by cutting through to the rabbet along the top inside face of the front (A).

TAPE SLIPPERY MITER JOINTS

Glue and clamp the back (C) between the sides (B). Slide the bottom (D) into place. Secure the miter joints with masking tape.



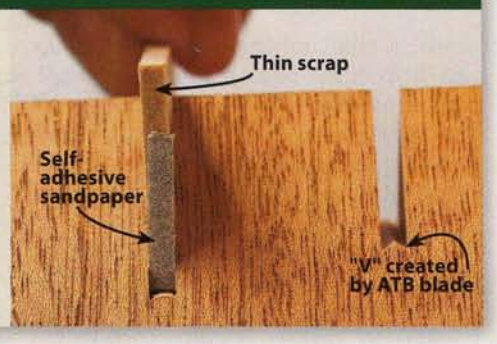
JIG FOR SPLINES

Cut ⅝"-deep kerfs closest to the top of the box. Raise the blade, and flip the box in the jig to cut ⅞"-deep kerfs toward the bottom.

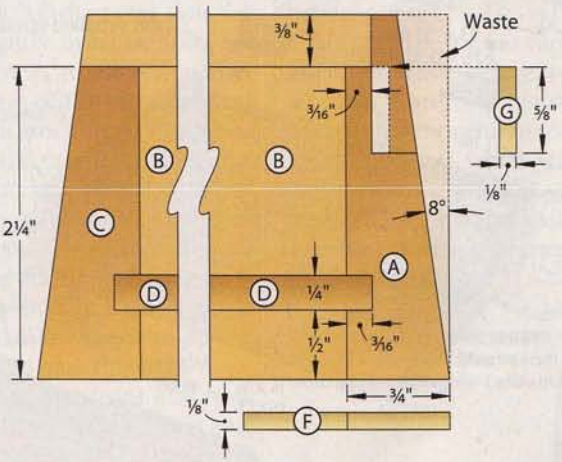
SHOP TIP

Flat-bottomed kerfs

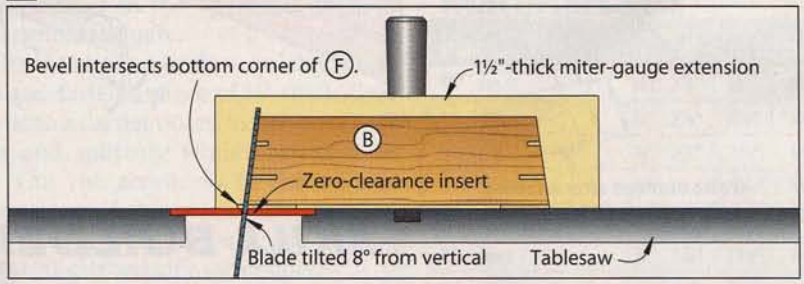
A blade with an alternating top bevel (ATB) tooth pattern leaves a V-shaped ridge in the kerf. That results in small gaps between the spline and the bottom of the kerf. To fix this, plane or sand a piece of scrap so it fits easily into the kerf. Attach a strip of 150-grit sandpaper to the edge of the scrap, and sand the "V" flat.



2 SIDE SECTION VIEW



3 BEVELING THE BOX



Accentuate the positives

1 To add the contrasting splines, first make a spline-slot jig like the one in **Photo D.** (Download a free plan for it at woodmagazine.com/splinejig.) Clamp the box in the jig and cut kerfs for the splines [**Drawing 1**]. A rip blade, or a blade with raker teeth, cuts kerfs with flat bottoms. If the kerfs aren't flat, see the **Shop Tip** *above* for a solution.

2 Plane or resaw and sand a 1×17" maple blank to fit snugly in the kerfs. Cut the splines (E) to length from this blank [**Materials List**, *page 51* and **Drawing 1**]. Glue a spline into each kerf, making sure it seats fully against the bottom of the kerf.

3 For the feet (F), cut a ⅛×1¾×10" blank. Cut the feet to length from the blank, and miter-cut two corners [**Drawing 4**].

4 Turn the box upside down, and draw lines 1½" from each corner [**Photo E**]. Glue the feet (F) in place aligned with these marks. After the glue dries, use a flush-cutting saw to trim the excess material from the splines (E) and feet. Sand the splines and feet flush to the box with 150-grit sandpaper.

5 Cut a handle filler (G) to fit the recess in the front of the box, and glue it in place [**Drawings 2, 4**].

Bevel the sides

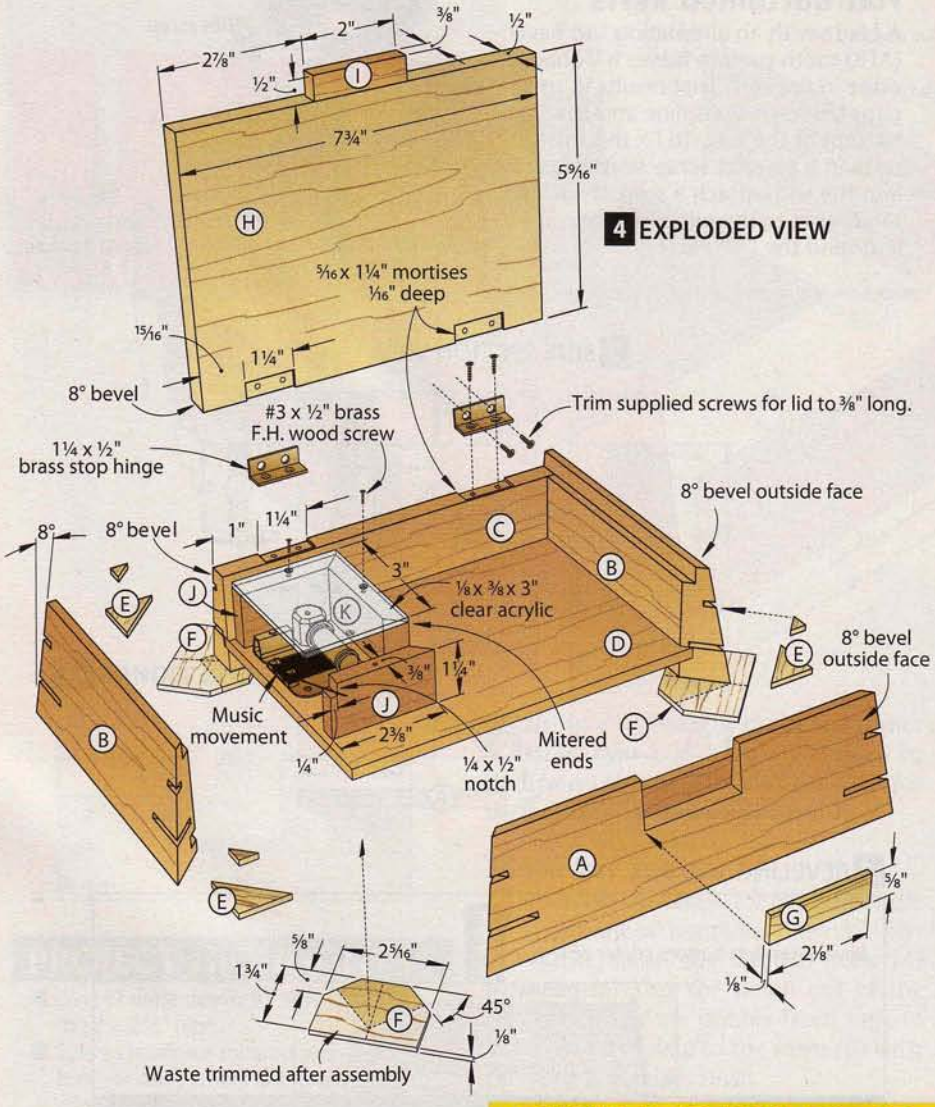
1 Make a 12"-long miter-gauge extension from 1½"-thick stock and attach it to the miter gauge. Tilt the tablesaw blade 8° from vertical, turn on the saw, and raise the blade through a blank zero-clearance insert [**Drawing 3**]. Raise the blade 2¾" above the table, and cut a kerf through the extension.

2 Use the kerf to help position the box as you bevel the front (A) and back (C) [**Drawing 3**]. Remove most of the waste on the first pass, then take light passes until the blade cuts just along the lower edge of the foot (F).

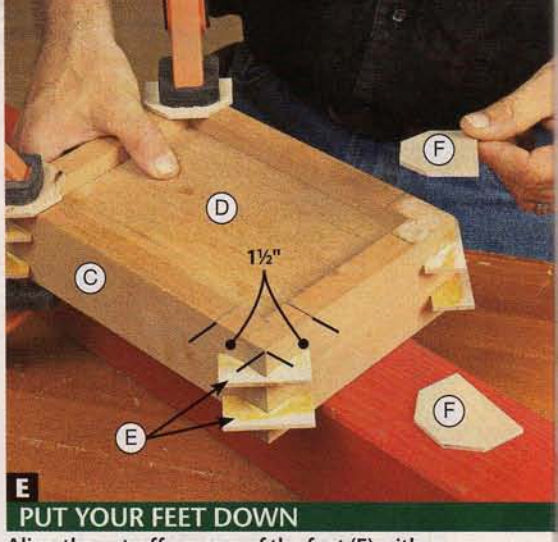
3 Remove the miter-gauge extension, and rip an 8° bevel on one of its faces. Reattach the extension to the miter gauge with the narrow edge down [**Photo F**]. Bevel the sides (B) of the box in the same manner as the front (A) and back (C). Then sand the outside faces of the front, back, and sides to 220 grit.

Handle the lid

1 To determine the size of the lid (H), measure from the back edge of the back (C) to the front of the rabbet in the front (A). Subtract 1/16" to get the lid width. The length of the lid is ⅛" less

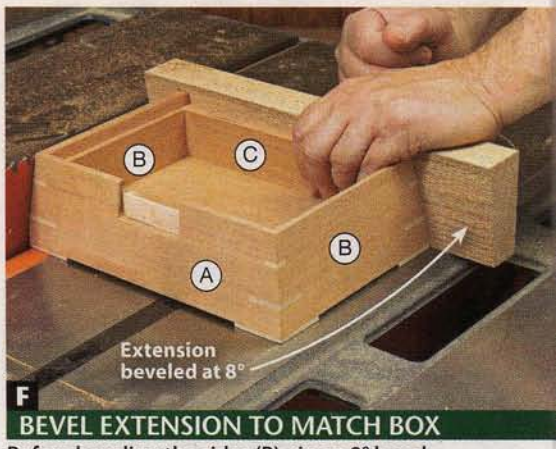


4 EXPLODED VIEW



E PUT YOUR FEET DOWN

Align the cut-off corners of the feet (F) with marks on the corners of the box. Make sure the feet stay in place as you clamp them.



F BEVEL EXTENSION TO MATCH BOX

Before beveling the sides (B), rip an 8° bevel on the miter-gauge extension so it fits firmly against the beveled front (A) and back (C).

than the measurement between the outside edges of the rabbets in the sides (B). When ripping the lid to width, bevel the rear edge at 8° to match the bevel on the back of the box [**Drawing 4**].

2 Cut the handle (I) to size. Glue it to the lid (H), centered from side to side and flush with the bottom edge of the lid [**Drawing 4**].

3 Cut the hinge mortises [**Skill Builder**]. Sand a slight chamfer on the rear edge of each mortise to provide clearance for the hinge barrel. Drill 1/16" pilot holes in the back (C) and lid (H), and screw the hinges to the box. *Check the length of the screws before installing them in the lid. If they would poke through the top face, cut them to length.* Before driving the shortened screws, drive a steel screw into the pilot hole to prethread it, then remove the screw.

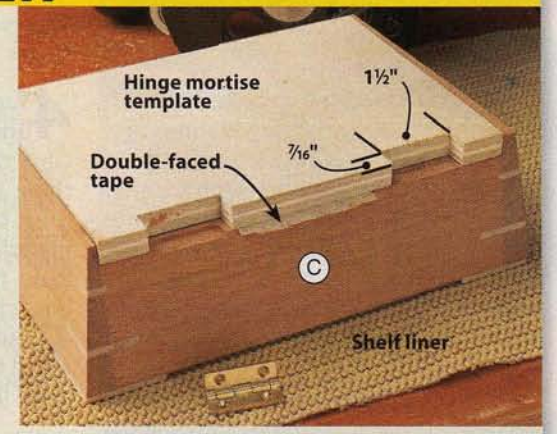
SKILL BUILDER

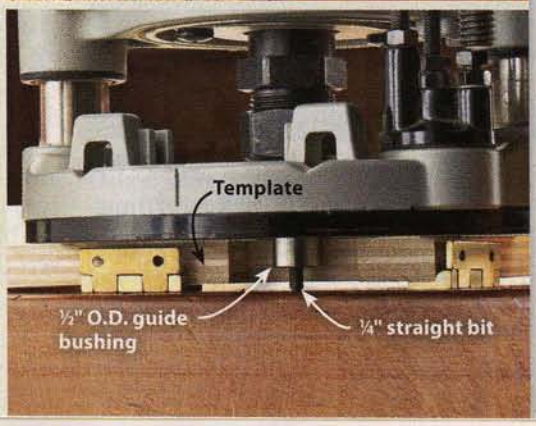
Create hinge mortises that match perfectly between the lid and box by using a template and a guide bushing in your router.

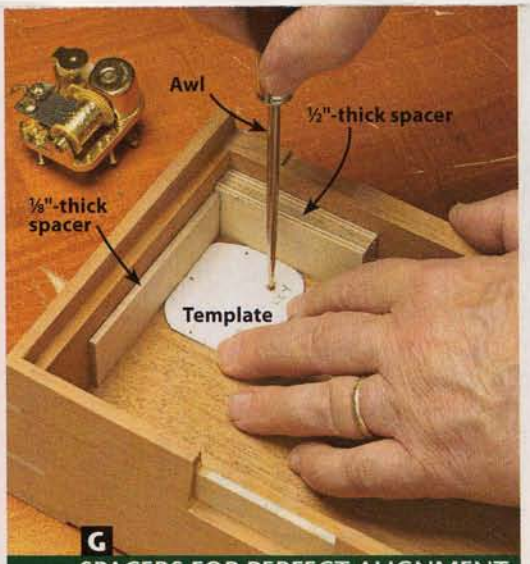
From 1/2" plywood, make a template to fit snugly in the rabbets in the top of the box *(right)*. Install a guide bushing and a straight bit in your router.

To create mortises exactly as deep as the hinge leaf, use the hinges to set the router bit depth *(bottom right)*. Place a leaf under each side of the template. Lower the bit through the template until it touches the benchtop; then lock the height adjustment. Secure the template to the box, and rout the mortises.

Center the same template on the lid. Tape the template face that faced up on the box against the underside of the lid. Rout the lid mortises. Square the corners of the four mortises with a chisel.

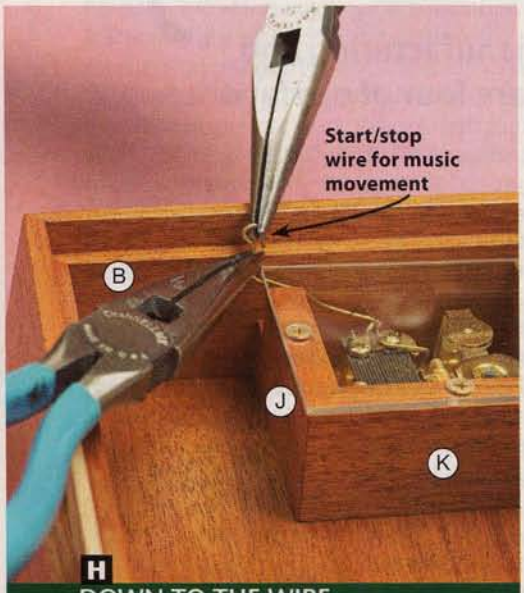






G
SPACERS FOR PERFECT ALIGNMENT

Instead of trying to measure in the tight confines of the box, cut spacers from scrap to help position the music movement template.



H
DOWN TO THE WIRE

Use needle-nose pliers to shape the music movement's start/stop wire so music starts when the lid opens and stops when it closes.

And now, a little music

1 Cut a poster board template the same size as the bottom of the music movement. Mark on the template the center of the key and sound holes, and the locations of the mounting screws.

2 Position the template in the box as shown in **Photo G**. Mark through the template the hole centerpoints.

3 To prevent chip-out when drilling the holes, support the bottom of the box with a piece of scrap. For the movement we used, we drilled a ½"-diameter sound hole and a 7/32"-diameter hole for the key. Drill slightly oversize holes for the mounting screws to allow for fine-tuning the position of the movement.

4 From ⅜"-thick stock, rip to finished width the music case front and back (J) and music case side (K) [**Drawing 4**]. Miter-cut one end of the music case front and back to finished length. Miter-cut both ends of the music case side to a finished length of 3". Cut a small notch in the front (J) to allow the wire on the music movement to pass through.

5 Sand the music case front and back (J) and side (K) to 220 grit. Then glue the music case together. Use masking tape to clamp the miters, and put a temporary spacer in the open side to keep the assembly square.

6 To make the window on the music case, fasten a piece of ⅛"-thick clear acrylic to a carrier board to prevent chipping and splitting while cutting it to size. Cut the acrylic to fit the outside dimensions of the music case [**Drawing 4**]. Polish the window's edges by buffing with 400-grit wet/dry sandpaper.

7 Place the window on the case, and mark with a felt-tip pen the location for a screw centered on each case piece (J, K). Drill 7/64"-diameter holes at these locations using a brad-point drill bit. Then countersink each hole to accept the head of a #3 wood screw. Screw the window to the music case, then glue this assembly to the bottom (D) of the box.

Time for the big finish

1 Remove the hinges and the window on the music case. Sand all parts to 220 grit. Then apply a finish. We sprayed on three coats of an aerosol semigloss lacquer, buffing with 0000 steel wool between coats.

2 Install the music movement in the music case before reinstalling the window. Carefully bend the start/stop wire for the movement so that the movement shuts off when the wire reaches the bottom of the rabbet in the side (B) [**Photo H**]. Reinstall the hinges and lid. Then wind the movement and let the music play.

Written by **Craig Ruegsegger** with **Doug Hicks**
Project design: **Jeff Mertz**
Illustrations: **Roxanne LeMoine**; **Lorna Johnson**

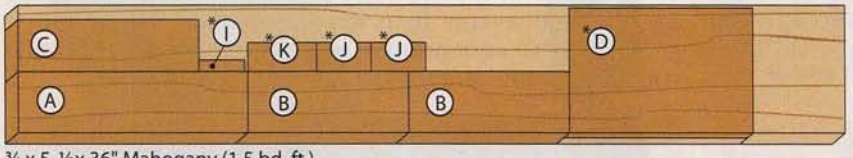
Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
*A	front	¾"	2⅝"	9"	MG	1
*B	sides	¾"	2⅝"	6½"	MG	2
C	back	¾"	2¼"	7⅞"	MG	1
D	bottom	¼"	5 5/16"	7 13/16"	MG	1
*E	splines	⅛"	1"	2"	ML	8
*F	feet	⅛"	1¾"	2 5/16"	ML	4
G	handle filler	⅛"	⅝"	2⅛"	ML	1
H	lid	½"	5 5/16"	7¾"	ML	1
I	handle	⅜"	½"	2"	MG	1
J	music case front/back	⅜"	1¼"	2⅜"	MG	2
K	music case side	⅜"	1¼"	3"	MG	1

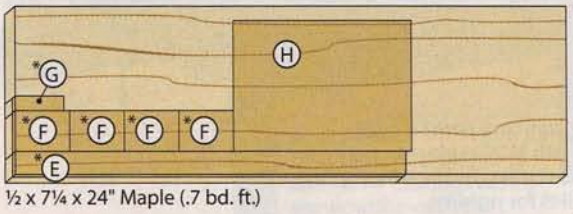
*Parts initially cut oversize. See the instructions.

Materials key: MG–mahogany, ML–maple.
Supplies: #3 × ½" brass flathead wood screws, 1¼ × ½" brass stop hinges, ⅛"-thick acrylic plastic, music movement.
Blades and bits: Rip and crosscut blades, ¼" and ½" straight router bits, ½" router guide bushing, 7/64" brad-point drill bit.

Cutting Diagram



¾ x 5 ½x 36" Mahogany (1.5 bd. ft.)
*Plane or resaw to the thicknesses listed in the Materials List.



½ x 7¼ x 24" Maple (.7 bd. ft.)

Sources

Hinges: Box stop hinges (2) no. 70391, $30.99 [pair], Rockler, 800-279-4441, rockler.com.
Music movements: "Brahms' Lullaby" no. 30458; "Amazing Grace" no. 30448; "Silent Night" no. 30446; "Pachelbel's Canon in D Major" no. 30591; "How Great Thou Art" no. 30452, $7.89, Klockit, 800-556-2548, klockit.com. Music movements available from Rockler: "Blue Danube" no. 34338; "Greensleeves" no. 36223, $12.59.

Lyptus

Combination Core

Branching Out:

4 Substitute Wood Products You Should Try

There's more to life than oak, pine, and plywood. Modern manufacturing and "green" thinking have led to a number of new woods. Here are four of our favorites.

Hardwood: Lyptus

The holy-grail quest of the lumber world has long been to find an inexpensive and sustainable alternative to genuine mahogany. The various African and South American substitutes that rise to the challenge often become increasingly unavailable and pricey as they gain prominence.

In steps Lyptus. A eucalyptus hybrid grown in sustainable-growth plantations in Brazil and distributed by Weyerhaeuser (800-320-9720, lyptus.com), Lyptus reaches maturity in about 15 years—2 to 4 times faster than similar hardwoods in colder climates—keeping its price low and its availability high.

WHY YOU SHOULD TRY IT: The color of Lyptus ranges from light pink to a deep cherry tone, and it finishes easily. While Lyptus's hardness, durability, and price are on par with hard maple, its fine grain resembles genuine mahogany. You can even find Lyptus plywood in a variety of thicknesses, colors and core options.

WATCH OUT FOR: Splintering. Lyptus splinters easily, so back up your routing, cutting, and drilling with scrap. (Some woodworkers choose to wear gloves when handling Lyptus to avoid the small splinters.) Like hard maple, Lyptus can be tough on your tools. Use carbide-tipped blades and bits and make sure that they are sharp to reduce splintering and tear-out. When routing, make multiple passes, removing no more than ⅛" of material at a time.

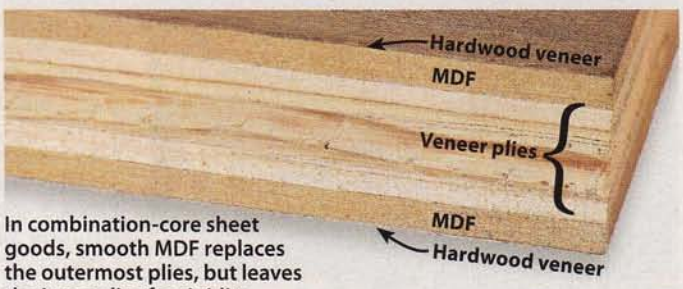
We used a walnut dye (Lockwood #99, 866-293-8913, wdlockwood.com) on the Lyptus, bottom, to resemble the walnut Danish oil finish of the genuine mahogany, top.

Sheet Goods: Combination Core

As manufacturers continue to reduce the thickness of veneer on sheet goods, it becomes easier to accidentally sand through that thin outer skin. And while hardwood-veneered sheets of medium-density fiberboard (MDF-core) give you smoothness, they're not suitable for applications where rigidity and strength count. Our advice: Take a look at combination-core sheet goods. Marketed variously as Combi Core, Armor Core, Classic Core, and Pro Core, combination-core sheet goods sandwich softwood plies between MDF layers, which are then faced with hardwood veneer.

WHY YOU SHOULD TRY IT: Combination-core sheet goods blend the best qualities of plywood and MDF. The plywood core provides rigidity and holding power for screws while keeping the weight to a more manageable level than MDF-core sheets. The MDF layers ensure that the imperfect plies don't telegraph through the top layer of veneer, giving you a smoother surface and a void-free substrate. These sheet goods are perfect for desktops or other surfaces that need a high-gloss finish where surface irregularities might otherwise stand out. Check with your local lumber supplier for availability.

WATCH OUT FOR: Price. You'll pay from 5 to 20 percent more for combination-core than for veneer- and MDF-core sheet goods. But that's not nearly as much as replacing the plywood you ruined while sanding out surface irregularities.



In combination-core sheet goods, smooth MDF replaces the outermost plies, but leaves the inner plies for rigidity.

Ipe

Bamboo

Outdoor Projects: Ipe

Looking for the ultimate, insect-repellent, rot-resistant wood for your next outdoor project? Take a look at ipe (pronounced EE-pay). Ipe's rich color and unmatched durability have made it the darling of deck construction for several years. Lumber retailers increasingly stock ipe as dimensioned hardwood. When finished properly, ipe makes a striking choice for outdoor furniture, planters, arbors, and footbridges.

WHY YOU SHOULD TRY IT: Ipe's durability seems almost magical. Naturally resistant to decay, moisture, insects—even fire—it's so dense that it actually sinks in water. And, though its price runs about twice that of cypress or cedar, with proper treatment, outdoor projects made from ipe will long outlive these less-durable woods and may very well outlive you.

WATCH OUT FOR: Construction considerations. Ipe's hardness is rough on cutters. Be sure to use sharp, carbide-tipped blades and bits. To avoid surface checking, immediately treat the ends of ipe with a wax-based end-grain sealer after cutting it. To maintain a rich walnut color, apply an annual treatment of a penetrating oil finish containing UV inhibitors such as Penofin (800-736-6346, penofin.com).

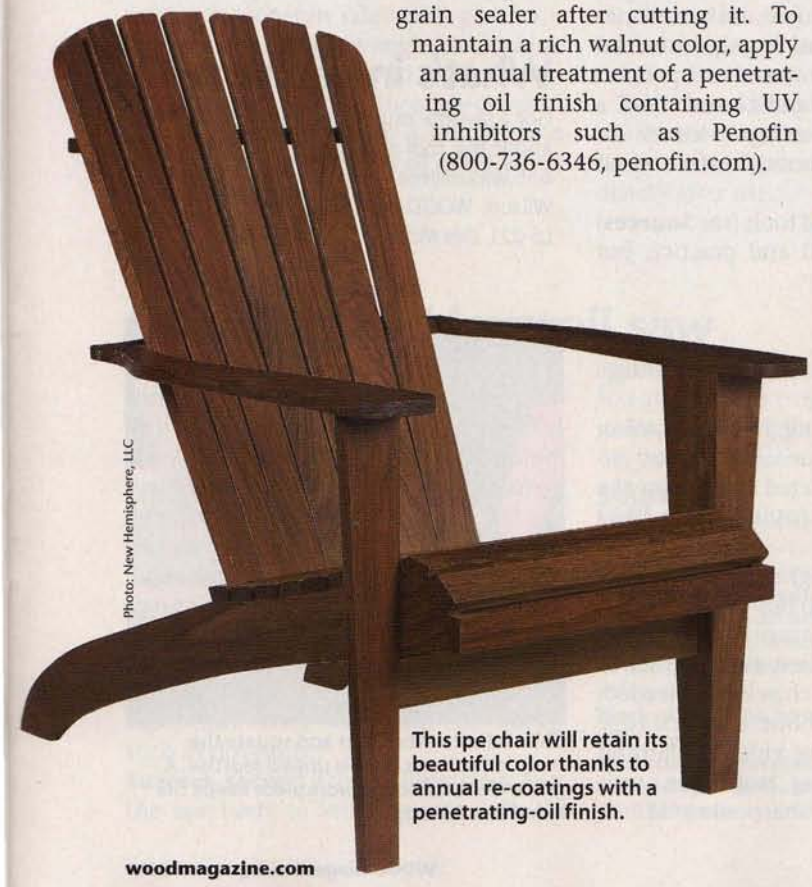


Photo: New Hemisphere, LLC

This ipe chair will retain its beautiful color thanks to annual re-coatings with a penetrating-oil finish.

Eco-sensitive: Bamboo

No longer limited to a dietary staple for pandas, bamboo is actually a grass with some pretty amazing qualities. It grows to harvestable size in 3–5 years and regrows after cutting. Its stalks can be cut into strips and laminated to form a surprisingly hard and stable woodlike material. Bamboo is making its way into all types of applications, from flooring and kitchen countertops to sheet goods and decorative banding.

WHY YOU SHOULD TRY IT: Manufacturers, such as Totally Bamboo (760-471-6600, totallybamboo.com), manipulate the distinct yet subtle grain patterns and color, to produce a nearly endless variety of patterns. As the even-toned, knot-free looks of bamboo become more and more popular, watch for an increasing number of products and materials made out of this versatile and affordable plant.

WATCH OUT FOR: Shredding. Use fine grits when sanding and shallow cuts when routing to avoid shredding bamboo's fibers. Also, bamboo's porous end grain quickly absorbs all liquids. Seal surfaces against moisture with an oil finish or polyurethane to avoid warping and swelling.

Written by **Lucas Peters**

Manufacturers laminate bamboo either horizontally (left) or vertically (right). Heating bamboo carbonizes the blond-colored stalks, darkening them to a caramel tone.

5 Problem-Solving Hand Tools...

...every woodworker should own and use religiously.

Not every woodworking task calls for a tool with a plug or a battery. Sometimes, the best tool for a job is powered by your own two hands.

Peek inside the *WOOD*® magazine workshop and you'll see nearly every stationary and hand-held power tool imaginable. But open the drawers nearest our workbenches, and you'll find them filled with well-used hand tools ranging from utility knives to block planes. That's because even the greatest assortment of the best power equipment can't handle every woodworking task.

A simple card scraper, for example, has no speed adjustment, no accessories or attachments, and barely even an instruction manual. But it can peel off an old finish faster and cleaner than a random-orbit sander, and leaves an almost-burnished smooth surface when used on bare wood.

Some of these hand tools (see **Sources**) require a bit of skill and practice, but most produce excellent results right off the bat. All of them deserve drawer space near your workbench.

What's in your shop?

Got a favorite must-have hand tool? Tell us about the tool and how you use it. Email bob.wilson@meredith.com, or write to Bob Wilson, *WOOD* magazine, 1716 Locust St., LS-221, Des Moines, IA 50309-3023.

1 Bench chisels

Like a trusty pocket knife, you'll reach for a sharp chisel to help with a host of odd jobs. Ours get a regular workout smoothing the walls of mortises roughed out on a drill press. For this task, you'll want a chisel at least 1" wide to pare the walls, as shown at *right*, and a ¼" or ⅜" chisel (or the nearest metric equivalent) for the ends. We prefer chisels with beveled edges, which can reach into tight corners or between hand-cut dovetails.

Other uses: Keep a set handy to tweak the fit of all kinds of joints, not just mortise-and-tenons. We also use bench chisels for everything from trimming off tiny bits of glue squeeze-out, to squaring router-rabbeted corners on the backs of frames, to shaving finish flaws from flat faces.

Success secret: Tougher steel generally costs more money. So buy the best quality you can afford, even if that means settling for the smallest available set or buying individual chisels as needed. Then learn how to hone a razor's edge on them. To see a free video explaining a no-fuss sharpening technique, visit woodmagazine.com/sharpeningvid.

SQUARE OFF A MORTISE

Chisels flatten the walls and square the rounded corners on this drilled mortise. A guide clamped to the workpiece keeps the chisel at a 90° angle.

2 Contour sanding grips

Look around your shop long enough, and you may eventually find some object the right size and shape to use as a temporary backer for sanding a profile. Instead, skip the search, and get a set of these pliable grips. Their varied contours sand everything from crown molding contours to ⅛" round-overs without altering the profile. A full set includes angled, concave, and rounded shapes.

Other uses: Use the narrow handle to reach deep into grooves. Or flex the handle against a gentle concave profile in place of a foam sanding pad.

Success secret: The small sanding surface area wears quickly, so frequently rewrap the grip with fresh abrasive. Small sanding tools have a way of disappearing; keep them organized in a kerfed scrap block, as shown at *right*.

MATCH PROFILE TO PROFILE

Foam sanding pads work well on broad curves, but contour sanding grips reach into and around tight curves and V-grooves.

3 Card scraper

Because it takes off so little wood, card scrapers smooth wildly figured woods without tear-out. On straight-grained wood, they also can eliminate at least one of the coarser sandpaper grits needed to remove tool marks. Use curved or goose-neck scrapers to shear tool marks off gently rounded profiles.

Other uses: Try removing a defective or damaged clear finish by sanding it away, and you'll quickly discover "corning." That's when finish turns into hard globs that clog sandpaper and mar a surface. A card scraper quickly peels off film finishes—including polyurethane, which resists abrasion, as shown *opposite top*. If necessary, follow up by finish-sanding at 180 or 220 grit, and you're ready to refinish the surface.

Success secret: Card scrapers work by planing off wisps of wood (or finish) using a tiny hook along the edge. To get a hook that's just right, see a free video at woodmagazine.com/cardscraper.

4 Low-angle block plane

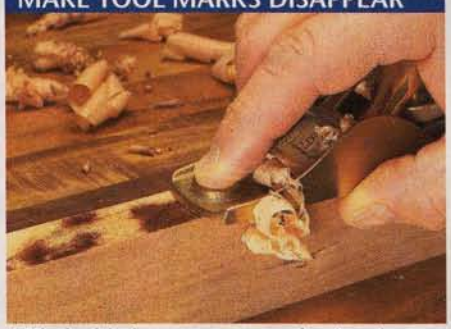
You'd need a stack of sandpaper to produce the smooth surfaces left by a few strokes from a well-honed block plane. Keep a sharpened one handy to perfect mating faces before edge-gluing joints.

Other uses: Try a low-angle block plane to cleanly trim proud end grain from a butted corner joint or through-dovetail joint. Unlike sandpaper, a block plane removes an even amount of wood when chamfering a sharp edge.

Success secret: Tune up any new plane by first flattening the sole using 180-, 220-, 320-, and 600-grit wet/dry abrasive sheets lubricated with WD-40 on a piece of plate glass. Rub the sole back and forth, rotating it end for end periodically, until it's uniformly shiny.

Then hone the blade using tips from the sharpening video mentioned earlier. Keep it sharp by storing the plane immediately after use.

MAKE TOOL MARKS DISAPPEAR



With the blade set to remove shavings less than paper thin, a basic block plane peels away burn marks in a couple strokes.

5 Flush-trim/dovetail saw

With no tooth set, these saws help you trim plugs or dowels flush without scarring the surrounding wood. As an added precaution in soft woods, such as pine, first push the exposed plug through a hole in a worn-out sanding disc, as shown at *right*. Then sand flat the remaining nub.

Other uses: At least one saw (see **Sources**) includes two interchangeable blades—one for flush-trimming, and the other with a rigid back for making super-thin kerfs for hand-cut joints, such as dovetails.

Success secret: For flush-cutting, flex the saw body to keep it pressed firmly against the wood surface, and cut on the *pull* stroke. Don't rotate the saw handle in a way that angles the teeth enough to dig into the surface.

Sources

Bench chisels: Boxed set of six bevel-edge chisels (¼", ⅜", ½", ¾", 1", 1¼") by Irwin Marples no. 30033, $70, Rockler, 800-279-4441, or rockler.com

Contour sanding pads: Set of 15, no. 68Z82.10, $14, Lee Valley Tools, 800-871-8158, or leevalley.com

Card scrapers: Set of two BAHCO Swedish scrapers, no. 02Z10 ,$18, Woodcraft, 800-225-1153, or woodcraft.com

Block plane: Veritas Apron Plane no. 05P27.01, $85, Lee Valley Tools.

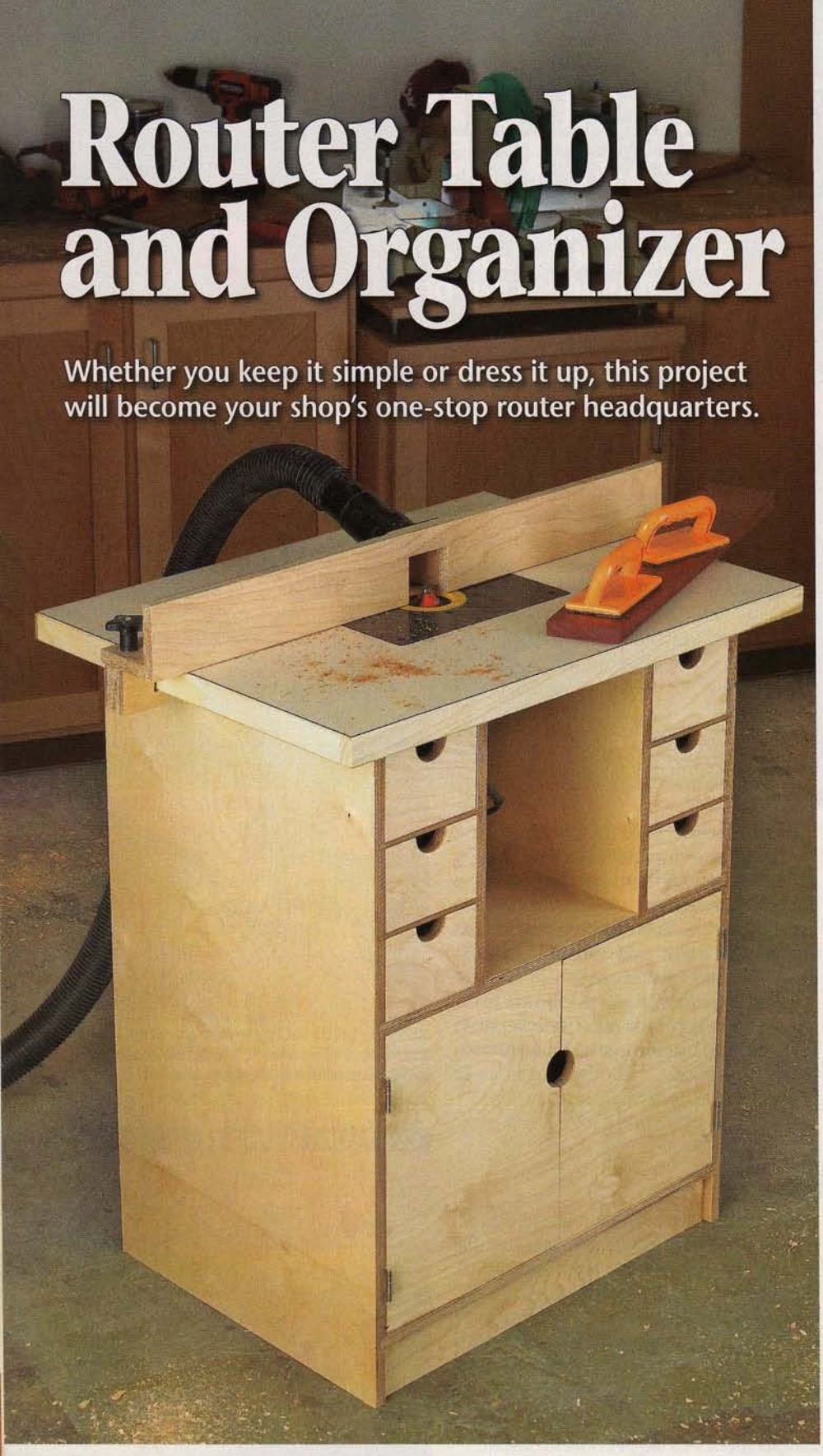
Flush-cutting/dovetail saw: Dozuki flush-cut/dovetail saw set with two blades and one handle no. 22305, $37, Rockler

CUT PLUGS WITHOUT SCRATCHES

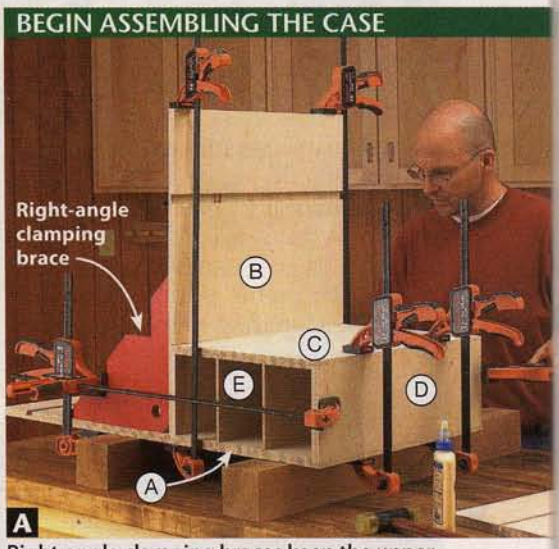
A disc placed abrasive-side down around the plug prevents minor saw tooth scratches should you accidentally pivot the blade.

Router Table and Organizer

Whether you keep it simple or dress it up, this project will become your shop's one-stop router headquarters.



When your router accessories have scattered around the shop like chips flung from a panel-raising bit, corral them in the drawers and cabinet of this virtually indestructible, easy-to-make router table. You'll gain a rock-solid worksurface, with quick router access to adjust and change bits. Then see *page 24* for accessories to make a great table even better.



Right-angle clamping braces keep the upper shelf (B) square to the side (A). (For free plans, go to woodmagazine.com/brace.) Square the drawer supports (E) and base top (D).

Begin with the case

1 Cut the base sides (A) to size [**Materials List**, *page 61*]. Then cut the shelves (B), dividers (C), base tops (D), and drawer supports (E) ¼" longer than required.

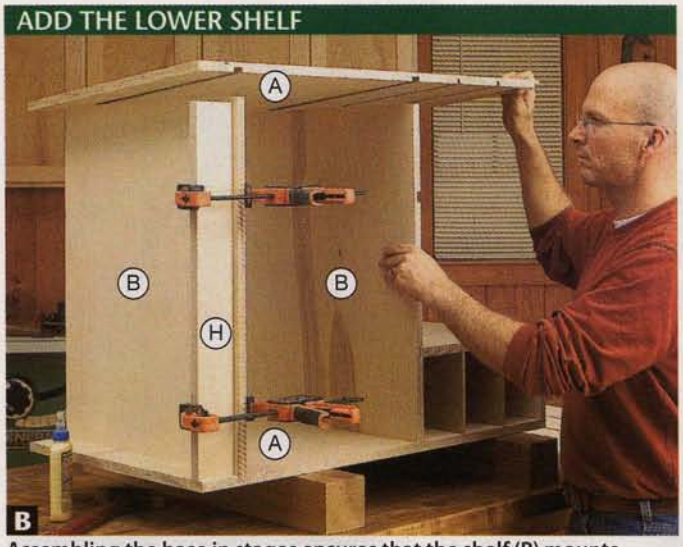
2 Dado and rabbet the base sides (A) and dividers (C) [**Drawings 1** and **1a**] to accept the shelves (B) and base tops (D). ***Quick tip: Don't rabbet your rip fence.*** *Attach a ¾"-thick sacrificial fence to your rip fence with double-faced tape when rabbeting less than 1" from your rip fence.* Cut dadoes in the upper shelf (B) to receive the dividers (C).

3 Rabbet the inside back edge of each side (A) to accept the lower back (F) and upper backs (G) [**Drawing 1a**].

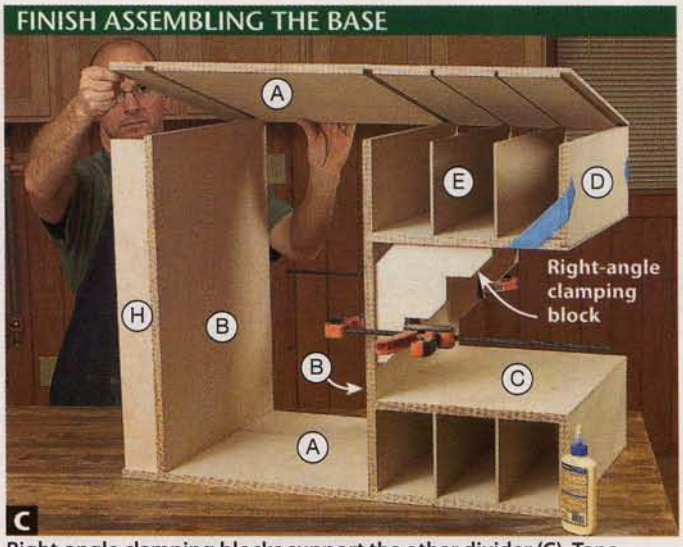
4 Lay out the drawer-support (E) locations on the sides (A) [**Drawing 1a**]. Resize the dado set to the drawer-support thickness, and dado the sides and dividers (C).

5 After allowing for plywood thickness variations, trim the dividers (C), base tops (D), and drawer supports (E) to length. Then cut the base rail (H) to size. Sand all plywood parts to 180 grit.

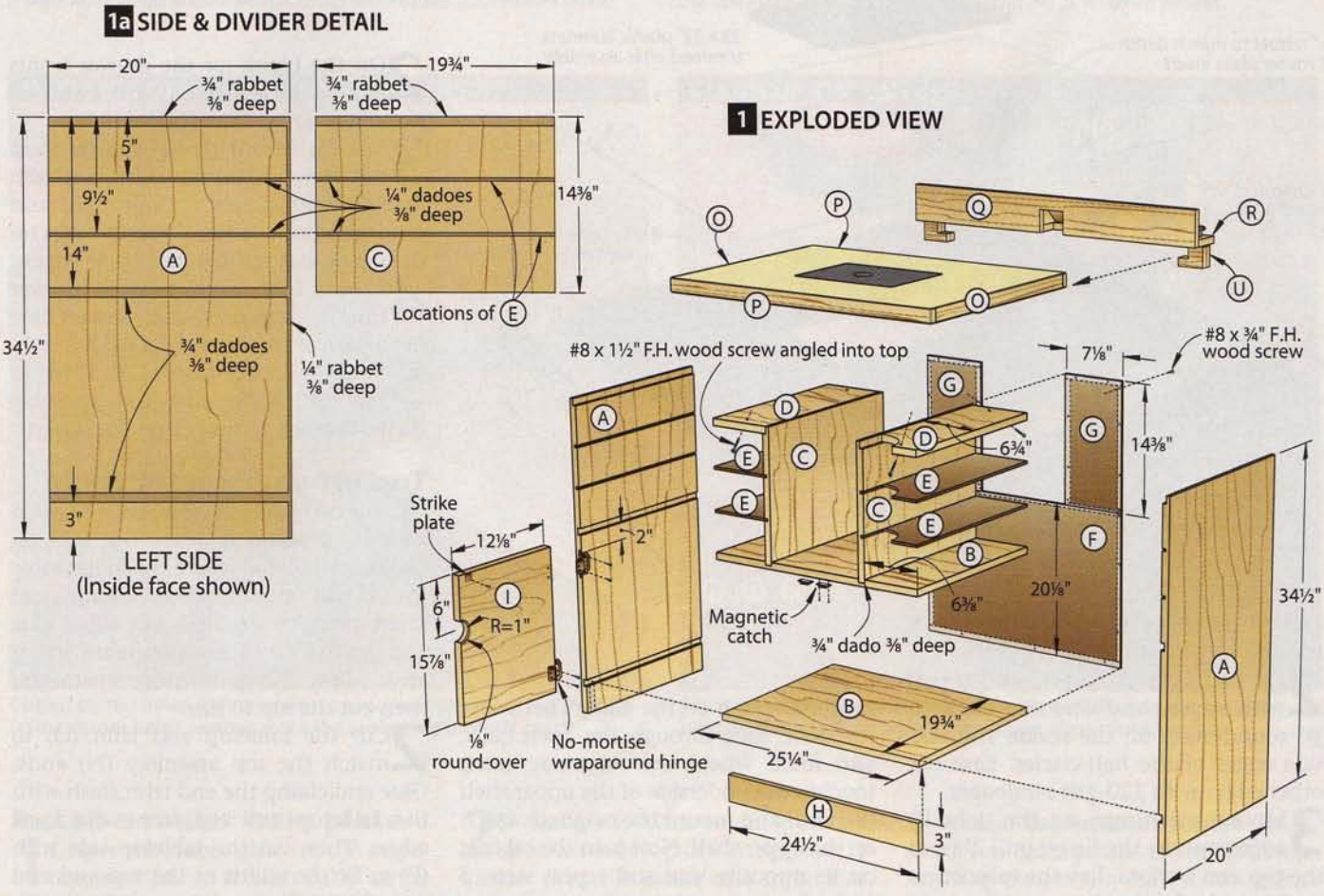
6 Rest one side (A) dado side up on your bench. Glue and insert a base top (D), two drawer supports (E), and the upper shelf (B) in the base side dadoes and rabbet [**Drawing 1**]. Then glue and add a divider (C) and clamp the assembly [**Photo A**].



Assembling the base in stages ensures that the shelf (B) mounts square to the side. The unglued side (top A) helps you align and clamp the subassembly.



Right-angle clamping blocks support the other divider (C). Tape temporarily holds the base top (D), while drawer supports (E) rest in their dadoes. Then glue and clamp the other base side (A).



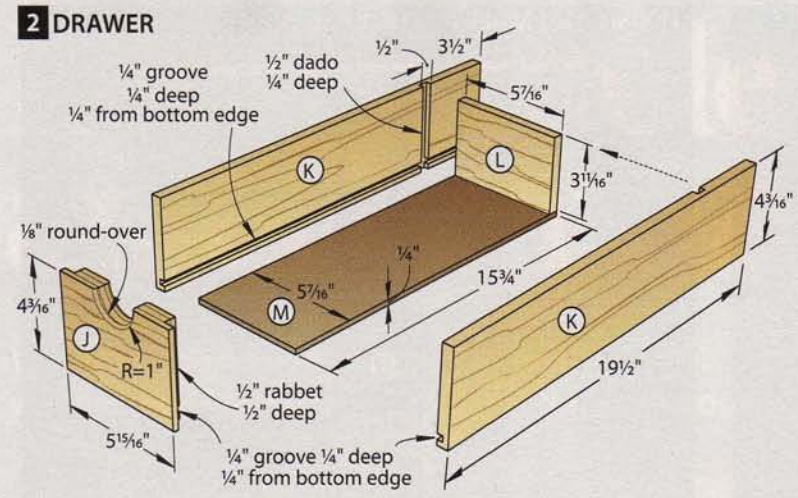
7 After the glue dries, glue and insert the bottom shelf (B) and base rail (H). Temporarily add, but don't glue, the other side (A) to align the assembly [**Photo B**] while clamping.

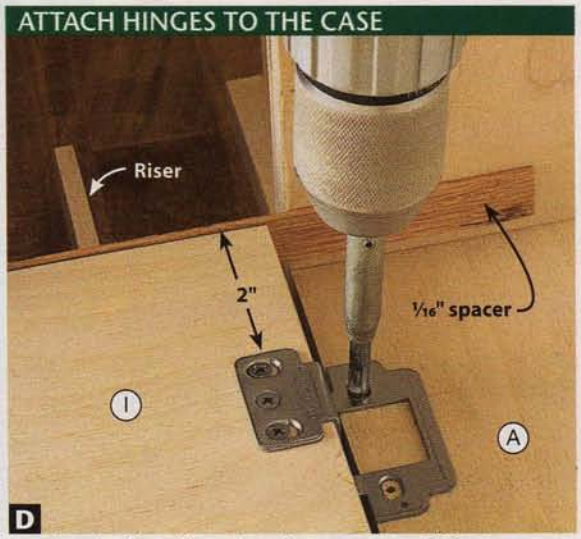
8 Attach right-angle clamping blocks to support the other divider (C). Glue and insert the divider into the upper-shelf (B) dado. Glue and insert the drawer supports (E) and base top (D), followed by the side (A) [**Photo C**].

9 Cut the lower back (F) and upper backs (G) to fit, and set them aside. Drill 5⁄32" holes through the base tops (D) at the front and back for mounting screws to install the top.

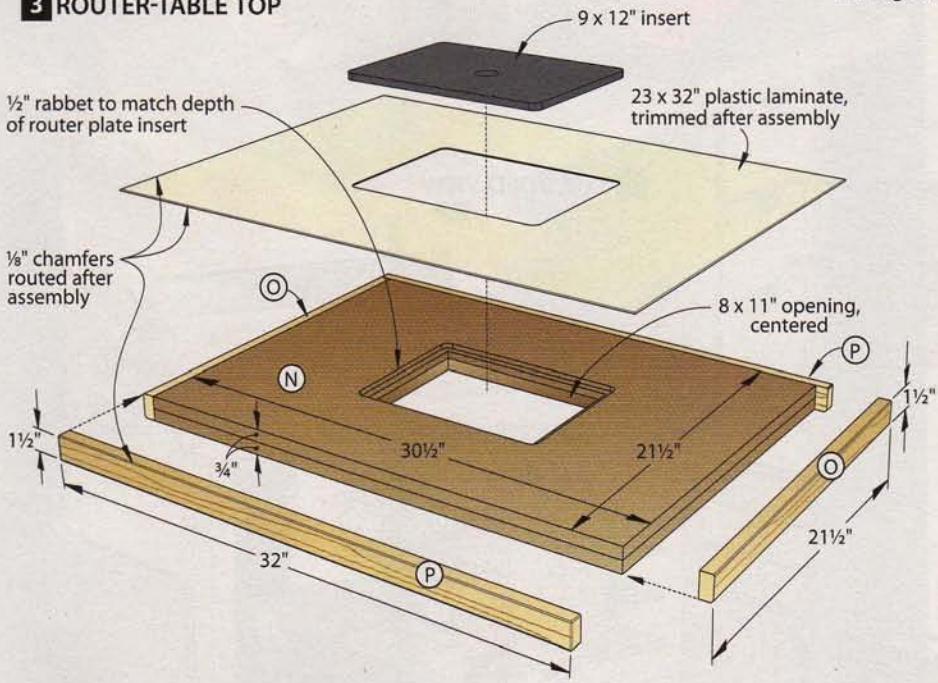
Now add two simple doors

1 Measure the height and width of the bottom compartment, then cut two doors (I) ⅛" shorter than the opening





Resting the door (I) on risers lets you control hinge placement on the case side (A). Center pilot holes in the oblong hinge slots to fine-tune the door position later.



and 3⁄16" narrower than half the width of the opening [**Drawing 1**].

2 On each door (I), cut the finger pull with a jigsaw and sand smooth. Rout ⅛" round-overs on the inside and outside edges of the half-circles. Ease the other edges with 120-grit sandpaper.

3 Mount the hinges on the door (I) edge opposite the finger pull 2" from the top and bottom. Lay the cabinet on its side and raise the door on risers (ours were ⅞" thick) to position it beside the cabinet. Use a 1⁄16"-thick spacer between the bottom edge of the door (I) and the lower shelf (B) to position the door. Screw the hinges to the case [**Photo D**].

4 Screw a magnetic strike plate to the door where shown and position a magnetic catch on the plate. Then close the door, look through the open back, and mark where the magnetic catch touches the underside of the upper shelf (B). Drill and mount the magnetic catch on the upper shelf. Now turn the cabinet on its opposite side and repeat steps 3 and 4 for the remaining door.

Make a six-pack of drawers

1 Measure the height of the drawer openings and rip a 38"-long blank 1⁄16" narrower than the opening height. Cut the drawer sides (K), backs (L), and bottoms (M) to size [**Drawing 2**].

2 On the blank for the drawer fronts (J) and each side (K), cut a drawer bottom groove where shown.

3 Cut each front (J) 1⁄16" shorter than the drawer opening width. On each drawer front, jigsaw a finger pull and sand it smooth. Rout ⅛" round-overs on the inside and outside half-circle edges.

4 Rabbet both ends of each drawer front (J) and dado each drawer side (K) to accept the drawer back (L).

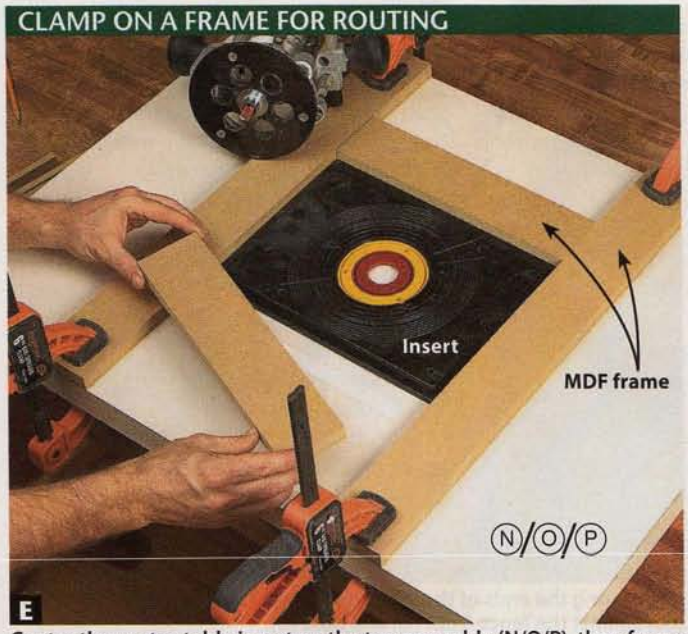
5 Sand all drawer parts (J, K, L, M) to 180 grit. Then glue and assemble them [**Drawing 2**], and check for square.

Top off your router table

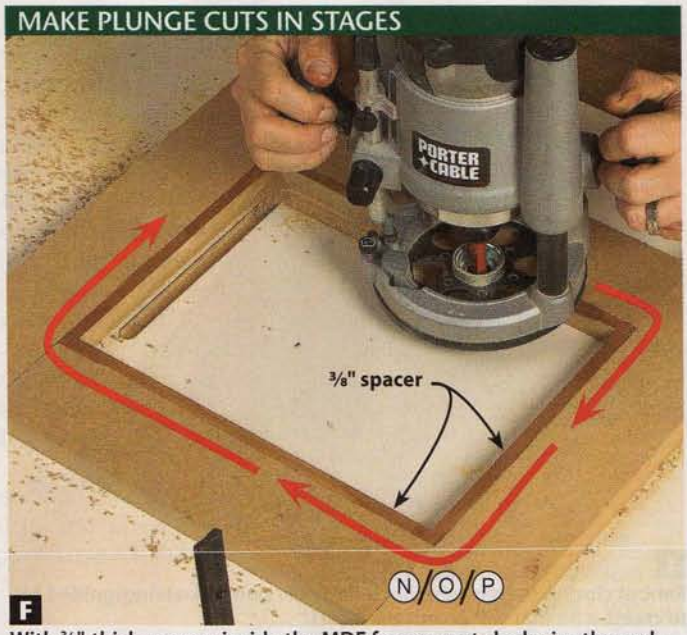
1 Cut two tabletops (N) about ¼" oversize [**Drawing 3**]. Mark the area on the lower tabletop where the router-table insert will mount. Glue, clamp, and screw the tops together, but avoid glue and screws in the router-table insert area. Allow the glue to dry overnight, then cut the top to size.

2 Cut the tabletop end trim (O) to match the top assembly (N) ends. Glue and clamp the end trim flush with the tabletop and the front and back edges. Then cut the tabletop side trim (P) to fit the width of the top and end trim (N/O). Glue and clamp it flush with the tabletop and end trim. Finish-sand the top assembly (N/O/P) to 180 grit.

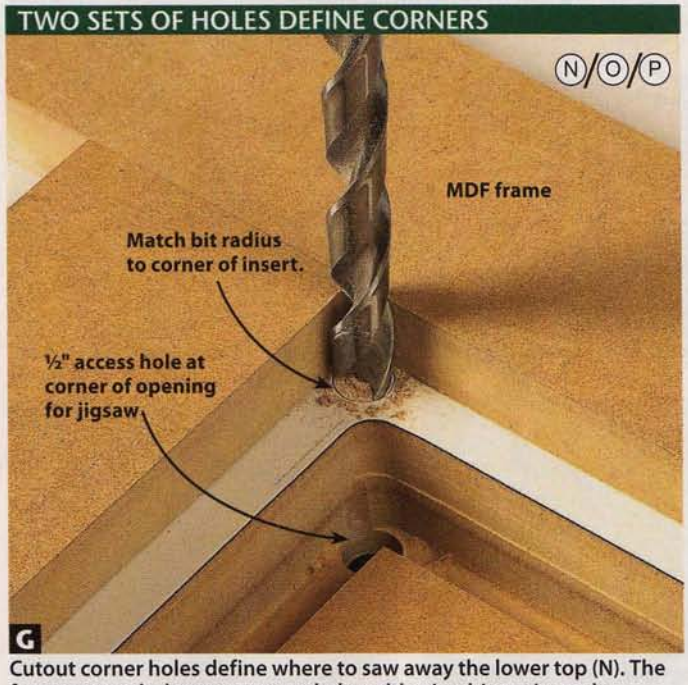
3 Cut a sheet of plastic laminate 1" oversize for the top assembly (N/O/P). Adhere it centered on the tabletop. Use a flush-trim router bit to trim the laminate flush with the trim (O, P).



Center the router-table insert on the top assembly (N/O/P), then frame it with MDF strips wide enough to accommodate your router base.



With ⅜"-thick spacers inside the MDF frame, rout clockwise through the laminate and upper MDF tabletop (N) in ¼"-deep passes.


TWO SETS OF HOLES DEFINE CORNERS
N/O/P
MDF frame
Match bit radius to corner of insert.
½" access hole at corner of opening for jigsaw
G

Cutout corner holes define where to saw away the lower top (N). The frame corner holes remove stock the rabbeting bit can't reach.

From the underside of the top assembly (N/O/P), ride the bottom-bearing flush-trim bit against the inside edge routed earlier.

Install a router base plate

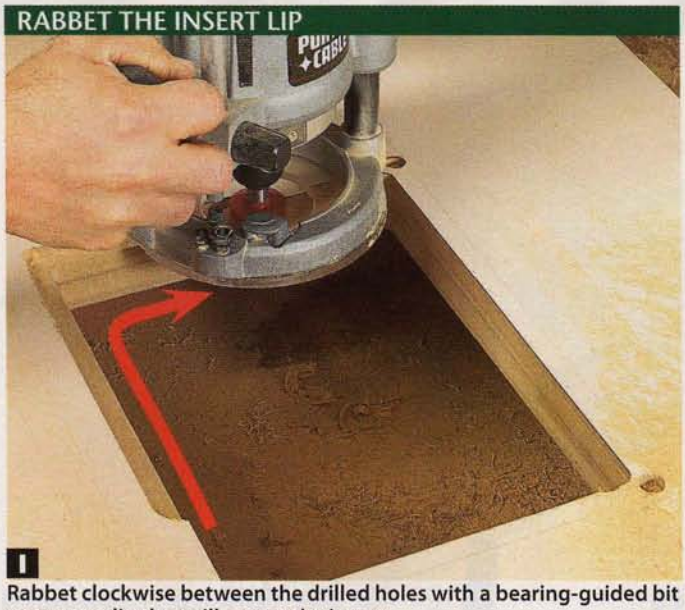
1 Center the insert plate on the tabletop, and frame it with MDF strips clamped and double-faced-taped to the tabletop [**Photo E**]. Remove the insert.

Note: *The router-table insert we used (see **Sources**) has a ½"-wide rabbet around the underside edge. If your insert lacks this lip, modify the spacer thickness and bushing diameter to adjust the dimensions in the following steps.*

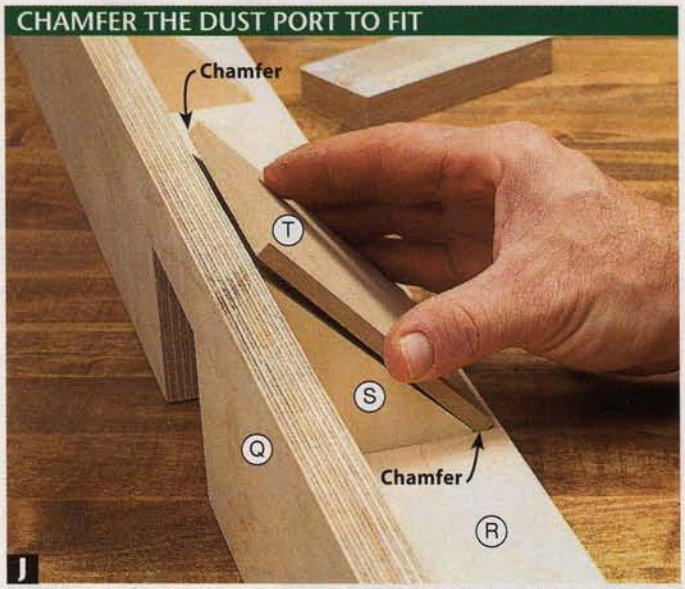
2 To leave a ½"-wide lip, first cut the table assembly (N/O/P) opening 1" smaller than the insert size. To do this, install a ½" straight bit and ¾" guide bushing on your router. Secure ⅜"-thick, ¾"-wide spacers to the inside edge of the MDF frame using double-faced tape. Plunge-rout through the laminate and top layer of MDF, working clockwise around the frame with the router bushing against the spacers [**Photo F**].

Quick tip: Use multiple passes. *Plunge rout in ¼"-deep passes to the maximum length of the bit to avoid overtaxing both router and bit.* Remove the ⅜"-thick spacers and the unglued upper layer of the tabletop (N).

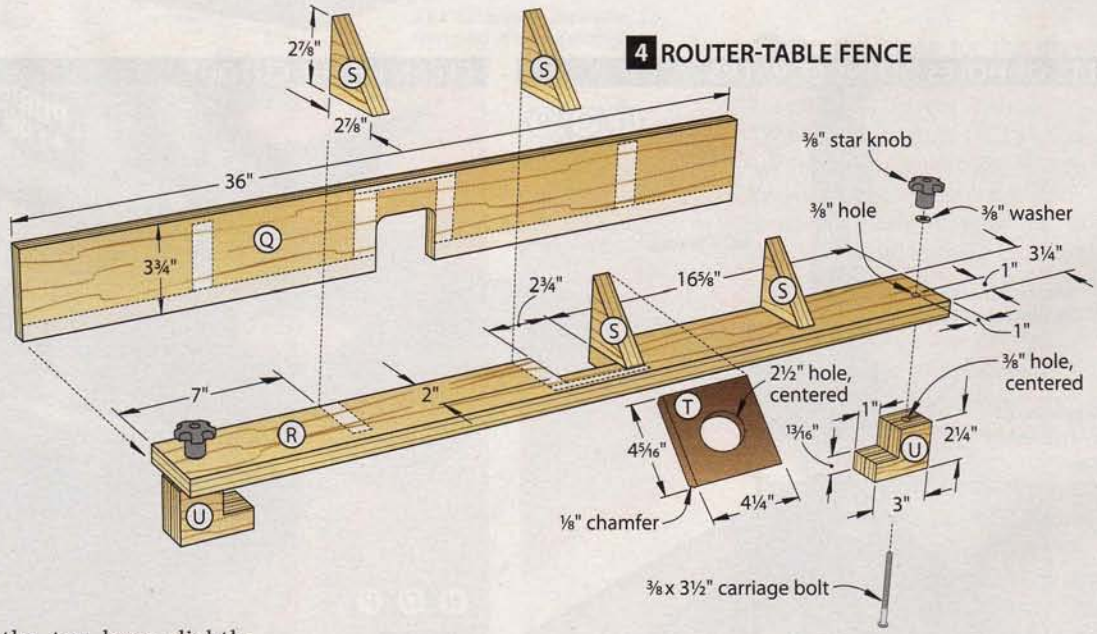
3 Using a drill bit with the same radius as the router-table insert corners, drill one hole through the top at each corner of the routed opening [**Photo G**]. Then, in the framed opening corners,



Rabbet clockwise between the drilled holes with a bearing-guided bit to create a lip that will accept the insert.



Chamfering the ends of the fence dust port (T) helps it form a tight seal against the fence front (Q) and base (R).



drill holes into the top layer slightly deeper than the insert thickness.

Note: *Our router-table insert has ¼"-radius corners, so we used a ½"-diameter drill bit. If your insert corner radius exceeds ⅜", drill these holes before routing the top.*

4 Remove the MDF frame from the top assembly (N/O/P), turn the top assembly upside down and draw lines between the centers of the holes. Cut out the opening with a jigsaw.

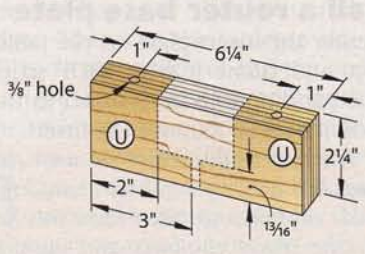
5 With a bottom-bearing flush-trim bit, rout from the table underside to clean up the opening [**Photo H**].

6 Turn the top laminate side up and install a ½" rabbeting bit set to the depth of the insert thickness. Then rout a ½" rabbet around the top opening [**Photo I**]. Clean up missed areas between the rabbet and the ½" holes with a chisel.

Quick tip: Lighten up on your final pass. *An insert that rests flush with the router-table top is crucial for smooth table routing. Remove most of the material for the lip supporting the insert in one or two passes, but make the final pass a light, skimming one to leave a smooth, uniform lip.*

7 Test-fit the insert in the opening. If the fit is too tight, lightly trim the plate on a tablesaw. If the plate is too loose, glue narrow filler strips around the tabletop opening.

8 Rout a ⅛" chamfer on the top and bottom edges of the trim (O, P); then ease the corners with sandpaper.



Build a fence for your table

1 Cut the fence front (Q), base (R), and supports (S) to size [**Drawing 4**].

2 Glue the fence front (Q) to the base (R). Then add the supports (S) and check for square.

3 Cut the fence dust port (T) to size. Sand a 45° chamfer on one end of the port to fit against the fence base (R) [**Photo J**]. Then chamfer the top end until the dust port rests flat on the supports (S).

4 Bore a centered 2½" hole in the fence dust port (T). Glue and clamp the port in place. Center a plastic dust port [see **Sources**] on the fence dust port; then drill and screw it in place.

5 To make the fence clamps (U), laminate two pieces of ¾" plywood to make a 1½×2½×6¼" blank [**Drawing 4a**]. Clean up the edges by cutting the blank to 2¼" wide. Square both ends, and drill ⅜" holes centered on the blank edge and 1" from each end. Then drill corresponding holes in the router fence base (R) where shown [**Drawing 4**].

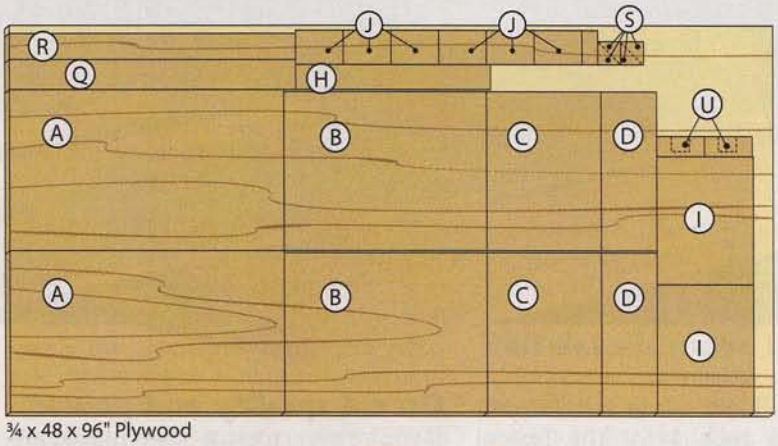
6 Saw the fence clamps (U) to size, and bandsaw notches where shown. Insert a carriage bolt through each clamp block and add the washer and knob.

7 Remove all the hardware, finish-sand the parts to 180 grit and apply a finish. (We used two coats of wipe-on polyurethane, sanding with 320 grit between coats.)

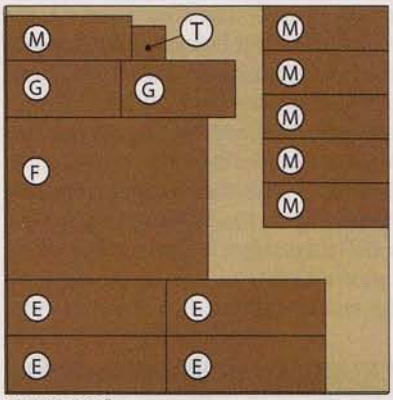
8 Mount the top assembly (N/O/P) to the base. Then drill and screw the lower back (F) and upper backs (G) to the base, and check for square. Now reattach the hardware, gather up those long-lost router accessories and get organized.

Written by **Bob Wilson** with **Jeff Mertz**
Project design: **Kevin Boyle**
Illustrations: **Roxanne LeMoine**; **Lorna Johnson**

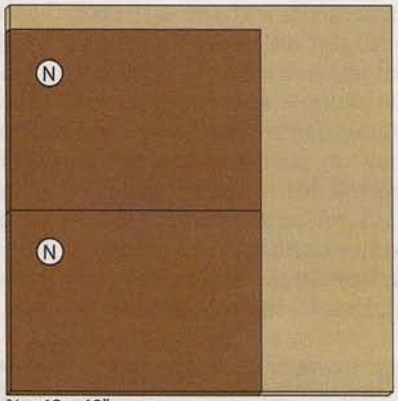
Cutting Diagram



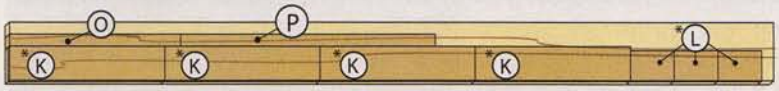
¾ x 48 x 96" Plywood



¼ x 48 x 48"
Medium-density fiberboard



¾ x 48 x 48"
Medium-density fiberboard



¾ x 7¼ x 96" Poplar (5.3 bd. ft.) (2 needed)
*Plane or resaw to the thickness listed in the Materials List.

¾ x 5½ x 96" Poplar (4 bd. ft.)

Materials List

Part		FINISHED SIZE T	W	L	Matl.	Qty.
Base						
A	sides	¾"	20"	34½"	BP	2
B*	shelves	¾"	19¾"	25¼"	BP	2
C*	dividers	¾"	14⅜"	19¾"	BP	2
D*	base tops	¾"	19¾"	6¾"	BP	2
E*	drawer supports	¼"	6¾"	19¾"	MDF	4
F	lower back	¼"	20⅛"	25¼"	MDF	1
G	upper backs	¼"	7⅛"	14⅜"	MDF	2
H	base rail	¾"	3⅛"	24½"	BP	1
I	doors	¾"	15⅞"	12⅛"	BP	2
Drawers						
J*	drawer fronts	¾"	4³⁄₁₆"	5¹⁵⁄₁₆"	BP	6
K	drawer sides	½"	4³⁄₁₆"	19½"	P	12
L	drawer backs	½"	3¹¹⁄₁₆"	5⁷⁄₁₆"	P	6
M	drawer bottoms	¼"	5⁷⁄₁₆"	15¾"	MDF	6
Tabletop						
N**	tabletop	¾"	21½"	30½"	MDF	2
O	tabletop end trim	¾"	1½"	21½"	P	2
P	tabletop side trim	¾"	1½"	32"	P	2
Fence						
Q	fence front	¾"	3¾"	36"	BP	1
R	fence base	¾"	3¼"	36"	BP	1
S	fence supports	¾"	2⅞"	2⅞"	BP	4
T	fence dust port	¼"	4¼"	4⁵⁄₁₆"	MDF	1
U**	fence clamps	1½"	2¼"	3"	BP	2

*Parts initially cut oversize. See the instructions.
**Laminate two pieces to make these parts. See the instructions.

Materials key: MDF–medium-density fiberboard, P–poplar, BP–birch plywood.
Supplies: #8×¾" flathead wood screws, #8×1½" flathead wood screws, plastic laminate 24×36", ⅜" star knobs (2), ⅜×3½" carriage bolts (2), ⅜" washers (2), magnet catches (2).
Blade and bits: ⅛" round-over, ½" straight (with ¾" bushing), bottom-bearing flush-trim, chamfer, ½" rabbeting bits; ½", 2½" drill bits; dado set.

Sources

Router-table insert. All-In-One Router Plate Kit (9×12") no. 9338, $35, MLCS, 800-533-9298, mlcswoodworking.com.
Universal dust port. For attaching a 2½" hose, use no. 92031, $7, Rockler, 800-279-4441, rockler.com.
No-mortise hinges. Flat-tip 2¾" sterling nickel hinges (4) no. A03180T G9 PK, $2.51 each, Woodworker's Hardware, 800-383-0130, or wwhardware.com.

SHOP TESTED

Rail-Guided Saws

Are these circ-saws-on-steroids worth their plump price tags? We test 5 models to find out.

Sleek and sexy, smoothly riding a shiny aluminum rail, leaving in its wake not a tattered mess, but crisp, clean edges ... one thing is certain: This isn't your father's circular saw. Dad, meet the rail-guided saw—the next generation of portable circular saw.

Rail-guided saws beat other circ saws hands down in four areas:

- They crosscut splinter-prone veneered plywood as well as or better than a good tablesaw and a top-flight blade.
- Cutting any odd angle is a breeze.
- When you need to start a cut in the middle of a workpiece (a sink cutout comes to mind), a rail-guided saw makes the job faster, safer, and more accurate than any other method, partly because the zero-clearance edge of the rail shows exactly where the blade will cut.
- Finally, hooked to a vacuum, the guards that surround the blade increase dust-collection efficiency, leaving the floor nearly as clean as the cut.

With quality, though, comes cost. The lowest-priced saw/rail pairing (Makita SP6000 with a 6½" blade and 55" rail) will set you back $465; the Festool TS75EQ costs $625 with its 8¼" blade and included 75" rail. (Add $125 more for the 55" extension and connectors that let you rip an 8' sheet of plywood.) For about the same price, you could instead buy a good contractor-style tablesaw with a clean-cutting blade.

So, are rail-guided saws worth it? We challenged five machines in a variety of hardwoods, softwoods, and sheet goods to find out. Here's what we learned.

On cut quality and power

If you've ever crosscut oak-veneered plywood, you know that the porous grain makes it difficult for nearly any saw and blade to cut cleanly. And the brittle surface of melamine-coated particleboard chips if you look at it wrong, much less cut it with a power saw.

All of the saws delivered impressive cuts [**Photo A**] on the "keeper" workpiece in both materials, thanks to the zero-clearance edge—a sacrificial plastic strip on the track that you cut the first time

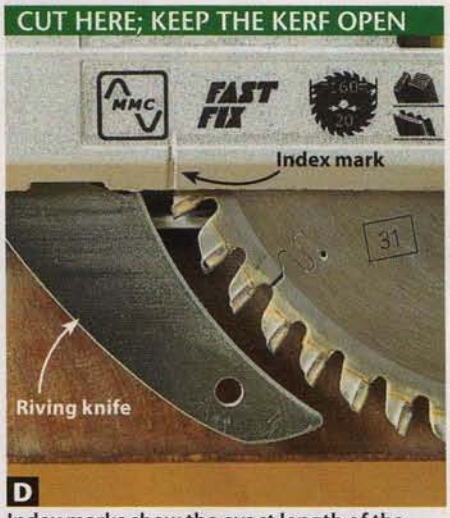
CLEAN, CLEAN, THESE CUTTING MACHINES

A

All five rail-guided saws delivered cabinet-quality crosscuts like this in birch-veneer plywood.

DeWalt's antikickback mechanism, engaged by this knob, blocks backward movement without restricting forward motion on the rail.

Although all of the saws cut bevels, Makita provides the widest range (-1° to 48°) with stops at both 22.5° and 45° (not shown).



Index marks show the exact length of the plunge cut. All saws except Makita also sport a spring-loaded riving knife.

you use it. Like a zero-clearance throat insert in your tablesaw, it virtually eliminates tear-out and fuzzing.

These machines excel at cutting sheet goods; but could one replace your tablesaw? In 4/4 poplar, ripcuts required some sanding or a light jointer pass before gluing. Cuts made by the cordless DeWalt DC351SKL felt smoothest while those made by the corded DeWalt DWS520SK needed a bit more attention.

But in thick, dense stock (we tried 8/4 hard maple), ripcuts tested the limits of some saws. Although the corded DeWalt and both Festool units displayed ample power to slab off strips of 2"-thick hard maple, the Makita and battery-powered DeWalt DC351SKL required slower feed speeds, which sometimes resulted in burning on the cut edges.

Because of the spring-loaded plunge system, setting cutting depth on these saws isn't as simple as on an ordinary circ saw. Instead of pivoting the base, you must set a depth stop. All operate easily, but we prefer DeWalt's scale that shows cutting depth by the thickness of material you're cutting—the ½" setting, for example, actually projects the blade ¾" below the saw base to account for the rail thickness. On the metric-marked scales on the Festool and Makita saws, you need to set the stop to at least 16mm for the blade to cut completely through 12mm (½") stock.

Rail details make the diff

A slot on the base of each saw fits over a raised guide rib on the 7"-ish-wide rail, and knobs let you dial in the base/rib fit precisely. As a practical matter, you can easily cut pieces as narrow as 4–5½" (depending on the saw), as long as that rib remains over the workpiece. A little jury-rigging with spacers enables you to work narrower stock.

Pliable strips on the bottom of each rail provide enough bite on the workpiece so that, in most cases, the rail stays put without clamps (optional for all saws). DeWalt's rail, though, didn't feel as "grippy" as the others, and in fact slipped about ⅛" on a 6'-long cut in melamine without clamps. Still, we almost always used the optional (and pricey, see chart on *page 64*) clamps on all of the rails: They mount on the underside of the rail so they never interfere, and we found that a little pressure goes a long way. One clamp was often all that was needed for a secure grip.

You can bevel-cut with these saws [**Photo B**], but tilting the saws more than about 25° shifts the center of gravity enough to start lifting the base from the rail. Makita combats this with a sliding lock that hooks into a special channel on the guide rib to prevent tipping.

Plunging to perfection

A rail-guided saw eliminates most of the danger of making a plunge cut: The base remains solidly on the rail throughout the plunge; and an antikickback stop, whether built-in (DeWalt, activated by the knob, **Photo C**) or mounted on the track (Festool), prevents the saw from moving backward during the plunge cut. (Makita recommends mounting a stop on the track, but doesn't offer one, or suggest how to do that.) Index marks on all of the saws show where the back and front of the blade will cut at full plunge [**Photo D**].

Your guide to the rail-guided saws

DEWALT DWS520SK

DeWalt DWS520SK, $500
DeWalt DC351SKL (cordless), $900

(Both prices include 59" rail)
800-433-9258, dewalt.com

If you plan to do a lot of plunge-cutting in sheet goods, either of these saws—identical except for the power source, motor, and sticker price—with built-in antikickback stops and intuitive cutting-depth scales (marked in inches) is an excellent choice. The depth-stop lock knob tightens easily, but can be tough to unlock, especially if you have limited hand strength.

In plywood, even the offcut pieces displayed a near-cabinet-quality edge, minimizing waste. Unique to DeWalt: Glide strips on the side of the blade guard provide a no-mar surface for cutting flooring along a wall or trimming the bottom of a door without the rail. And you can run the saw along either edge of the rail, so you don't have to turn it end for end to change cutting direction (but we didn't see much benefit to this feature). The cordless DC351SKL cut 34' of inch-thick poplar on a full one-hour charge of its 28-volt lithium-ion battery.

BOILING DOWN THE RAIL-GUIDED SAWS: SPECS AND GRADES

		SAW							RAIL			PERFORMANCE GRADES (4)							ACCESSORIES (5)				
												PRIMARY			SECONDARY							
BRAND	MODEL	VOLTAGE	MOTOR SPEED RANGE (RPM)	BLADE DIAMETER, INCHES	BLADE TOOTH COUNT	RIVING KNIFE? (Yes or No)	MAXIMUM DEPTH OF CUT WHEN USED WITH RAIL, INCHES	BEVEL RANGE, DEGREES	MINIMUM WORKPIECE WIDTH, INCHES (1)	LENGTH OF INCLUDED RAIL, INCHES (2)	LENGTH/PRICE OF ADDITIONAL RAILS (3)	OBSERVED POWER IN 4/4 POPLAR	RIPCUT QUALITY IN SOLID WOOD	CROSSCUT SURFACE QUALITY IN PLY	OBSERVED POWER IN 8/4 MAPLE	EASE OF MAKING PLUNGE- CUTS	EASE OF MAKING BEVEL- CUTS	EASE OF CHANGING BLADES	STANDARD	OPTIONAL	WEIGHT INCLUDING BLADE, LBS	CORD LENGTH, FEET	
DEWALT	**DC351SKL**	28	3,500	6½	40	Y	2⅛	0–47	4	59	46"/$80, 102"/$230*	C	A	A	d	a	a-	b	B,K,R	C,R	12.5	N/A	
	DWS520SK	110	1,750–4,000	6½	48	Y	2⅛	0–47	4	59		B	B	A	b	a	a-	b	B,K,R	C,R	12.5	13	
FESTOOL	**TS55EQ**	110	2,000–5,200	6¼	48	Y	1 15/16	0–45	5⅜	55	from 32"/$63 to 197"/$474	A	A-	A	b	a	a-	a	B,K,R	C,R,S	11.0	13	
	TS75EQ	110	1,350–3,550	8¼	36	Y	2¾	0–45	5⅜	75		A	A-	A	a	a	a-	a	B,K,R	C,R,S	14.8	13	
MAKITA	**SP6000**	110	2,000–5,200	6½	48	N	2 3/64	-1–48	5½	*	55"/$80, 117"/$200	A	B+	A-	d	b-	a	b	B	C,R	10.4	8	

1. Narrower workpieces can be cut using spacers the same thickness as stock.
2. (*) Saw and rail sold separately
3. (*) 102" rail costs only $100 when purchased in kit with saw and 59" rail

4. A Excellent
   B Good
   C Fair
   D Poor

5. (B) Carbide blade
   (C) Clamps
   (K) Antikickback stop
   (R) Rail
   (S) Specialty blades

6. (C) Czech Republic
   (G) Germany
   (U) United Kingdom

FESTOOL TS75EQ

Festool TS55EQ (6¼" blade), $500

(Price includes 55" rail)

Festool TS75EQ (8¼" blade), $625

(Price includes 75" rail)
888-337-8600, festoolusa.com

Just because something was first doesn't make it best. But in this case, Festool's veteran TS75EQ outshone the upstarts. Its 13-amp motor tackled 8/4 hard-maple rips without complaint, and it left clean edges in melamine and veneered ply, even on the waste piece. Where blade changes proved a three-handed operation on other saws, Festool's "Fast Fix" system locks both plunge depth and arbor rotation with one flip of a lever. (The detachable cord makes blade changes safer, too.)

We do have quibbles: Is it too much to ask for imperial (inch) depth-of-cut scales instead of metric? And the depth indicator doesn't include the thickness of the rail, so you have to add a couple of millimeters to cut completely through your material. We liked Festool's quick-ratcheting clamps, but they're pricey—$38 apiece. The TS55EQ, a smaller version of the TS75EQ, with a 10-amp motor and a 6¼" blade, provides 13/16" less thickness capacity than the TS75EQ.

	WARRANTY, YEARS	COUNTRY OF ASSEMBLY (6)	SELLING PRICE (7)
	3	C	$900
	3	C	500
	3	G	500
	3	G	625
	1	U	465*

7. Prices current at time of article production and do not include shipping, where applicable.
(*) With 55" rail.

Makita SP6000, $465

(Saw and rail sold separately. This price includes a 55" rail.)
800-462-5482, makitatools.com

The SP6000 both delighted and disappointed us. We like it for bevel-cutting, because it provides the widest range with stops at 22.5° and 45°, and it features a unique lock to keep the saw from rocking off the rail on wide bevel-cuts. For scoring tear-out-prone materials, a shallow preset depth stop projects the blade about ⅛"; after making this cut, you then release the stop and through-cut at full depth. We found this scoring cut necessary to leave a splinter-free edge on the waste side of the cut. But the SP6000 lacks features common on the other saws, such as an antikickback stop for plunge-cuts and a riving knife. And in 2"-thick hard maple, we had to slow the feed rate, resulting in burned edges.

Tops of the track saws

A rail-guided saw will never replace a tablesaw, but it sure outperforms any panel saw we've tried (at a much lower price, too), and doesn't limit you to perpendicular cuts—you'll get high-quality cuts at any angle. Our Top Tool, the hefty Festool TS75EQ, displayed ample power and precision in everything from sheet goods to thick hardwoods. If you'll work primarily in sheet goods, and make plunge-cuts at that, we call the lighter-weight DeWalt DWS520SK and Festool TS55EQ different but equal. Buy the DeWalt if you value a better depth-of-cut system more than easy blade changes.

Written by **Dave Campbell** with **Dean Fiene**

Corral the Clutter

Printer Stand

Create—and organize—space under your computer's printer with this weekend project.

First, build a case

1 To make blanks for the bottom and top (A), case sides (B), center partition (C), top and bottom trim (D), and shelves (E), start with ¾"-thick stock. Edge-glue four 7½×43" panels. (See **More Resources**, *page 69*.) After the glue dries, plane the blanks to ½" thick and joint the edges square to the faces. Edge-glue pairs of blanks together to create two 15"-wide panels [**Photo A**]. Lay a straightedge across each panel at several points to check for flatness. After the glue dries, sand or scrape the joint flush if needed.

2 Cut the top and bottom (A) to length from one blank [**Materials List,** *page 69*]. (You'll rip them to width later.) Cut the case sides (B) and center partition (C) to length from the other blank.

3 To get a perfect grain match between the trim pieces and the top and bottom, rip the top trim and bottom trim (D) from the front edge of the top and bottom (A) [**Drawing 1**]. Mark the mating edges so you can glue them back later in the same orientation.

4 Set up a dado blade to match the thickness of the panels. Cut ¼"-deep dadoes in the top and bottom (A); then lower the blade to cut ⅛"-deep dadoes in the case sides (B) and center partition (C) [**Drawing 1**]. Back up the cuts with a follower board to prevent chip-out. Then rip these parts to final width.

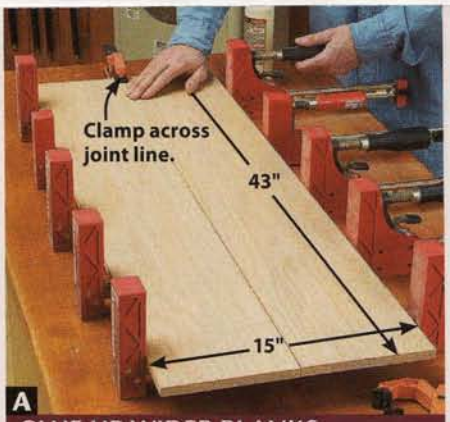
5 Rip the shelves (E) to finished width [**Drawing 1**]. Dry-assemble the case and cut the shelves to fit snugly between the sides (B) and center partition (C).

PROJECT HIGHLIGHTS

- Overall dimensions: 20½" wide × 15⅛" deep × 9¼" high.
- Partitioned shelves keep paper and envelopes handy.
- Drawers store ink or toner cartridges and small office supplies out of sight.

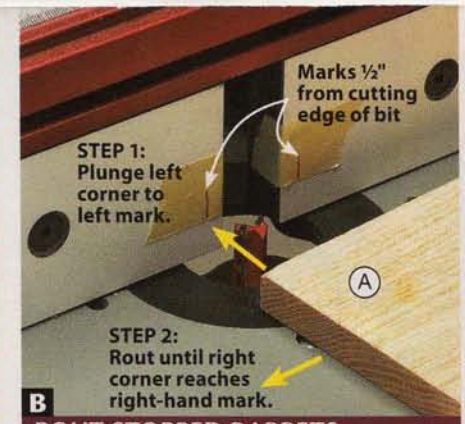
Skill Builders

- Learn how to join panels wider than the capacity of your benchtop planer — and make them flat.
- This project incorporates many features typically found in large fine-furniture pieces: raised drawer fronts, contoured feet, and shapely profiled edges.



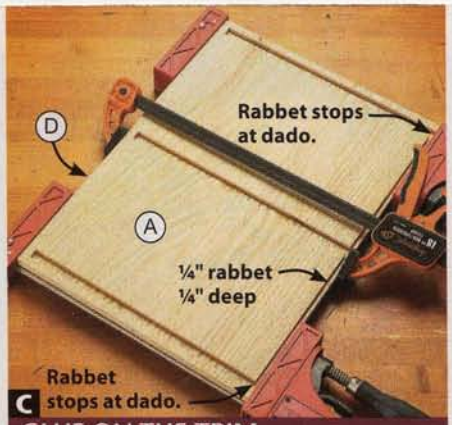
GLUE UP WIDER BLANKS

Small clamps keep the ends of the joint line flush. Check that the joint is flush along its length as you tighten the large clamps.


Marks ½" from cutting edge of bit
STEP 1: Plunge left corner to left mark.
A
STEP 2: Rout until right corner reaches right-hand mark.
B

ROUT STOPPED RABBETS

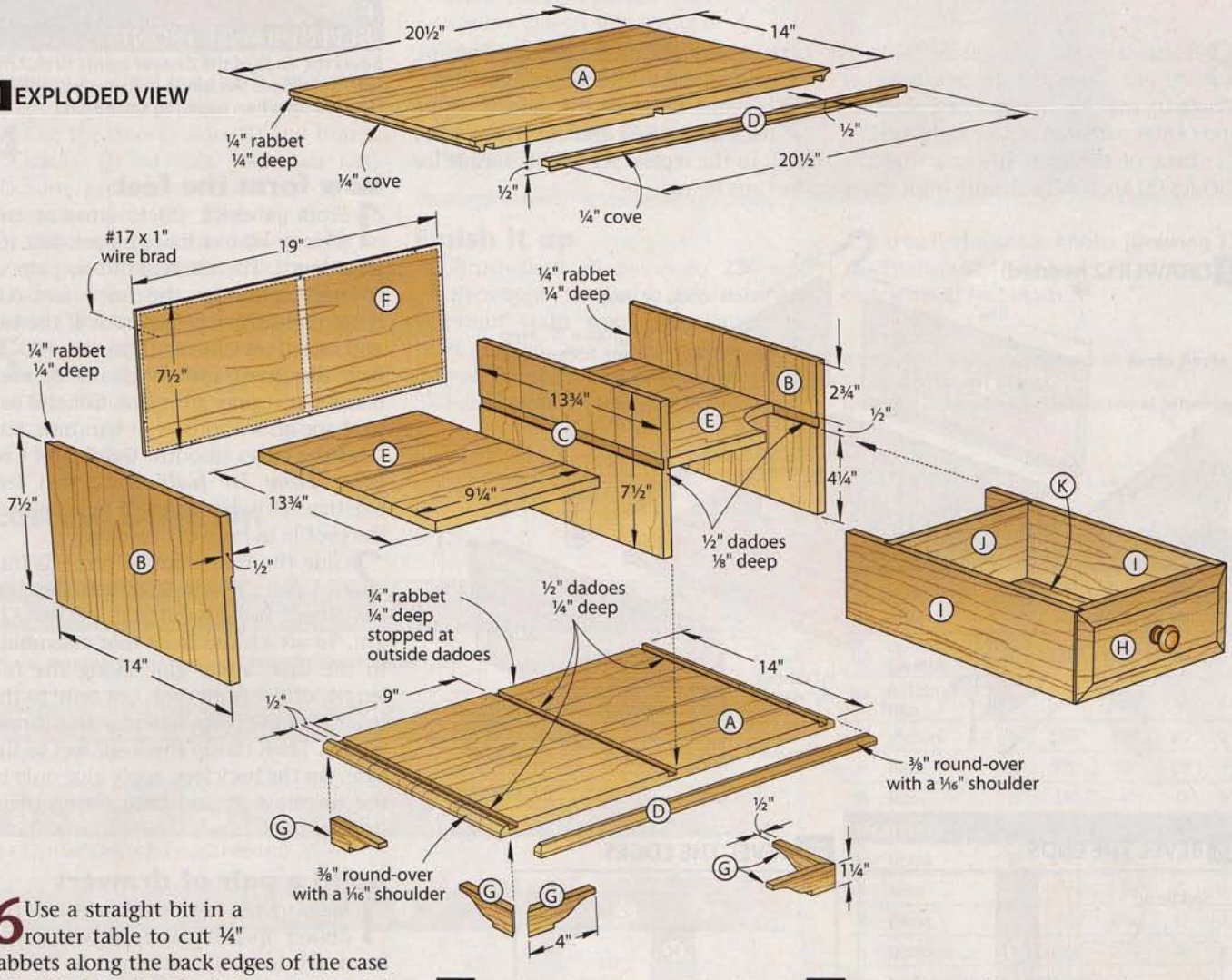
Move the workpiece (A) onto the bit so the left end hits the left-hand mark; then rout until the right end hits the right-hand mark.



GLUE ON THE TRIM

For a joint line that disappears, orient the trim (D) exactly as it was cut from the blank for the top and bottom (A).

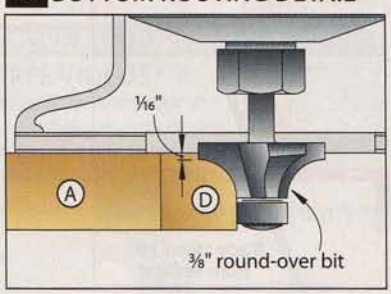
1 EXPLODED VIEW



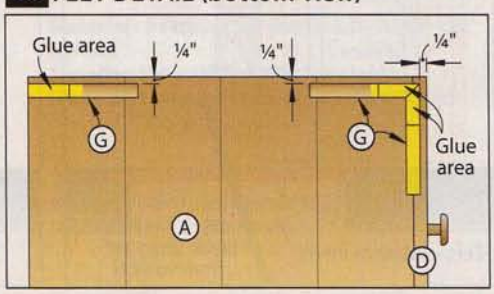
6 Use a straight bit in a router table to cut ¼" rabbets along the back edges of the case sides (B) [**Drawing 1**]. Then rout stopped rabbets between the outside dadoes of the top and bottom (A) [**Photo B**].

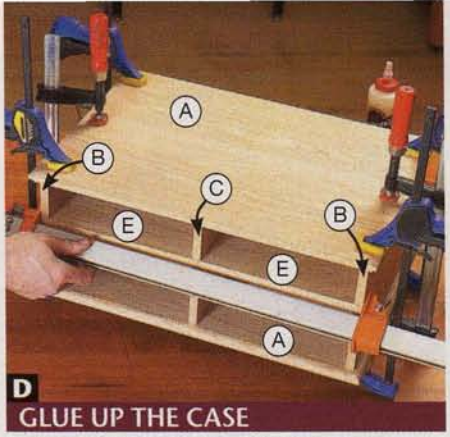
7 Now you can glue the top trim and bottom trim (D) back onto the top and bottom (A) [**Photo C**]. After the glue dries, rout a ¼" cove on the underside of the top (A) along its ends and front edge [**Drawing 1**]. Rout a ⅜" round-over with a 1/16" shoulder on the ends and front edge of the bottom [**Drawing 1a**].

1a BOTTOM ROUTING DETAIL



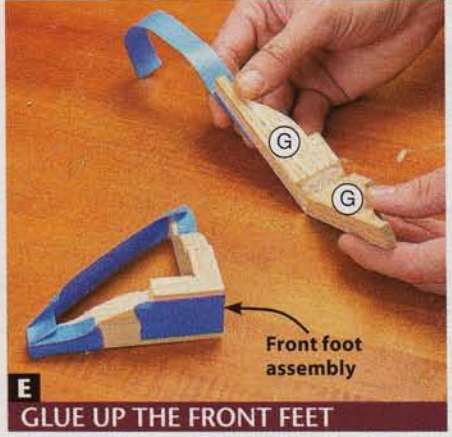
1b FEET DETAIL (bottom view)





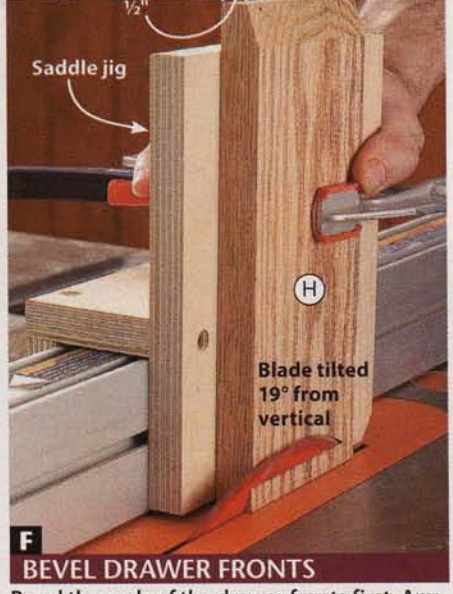
D GLUE UP THE CASE

Position the clamps to apply pressure directly across the dadoes that hold the case sides (B) and shelves (E).



E GLUE UP THE FRONT FEET

To clamp the front foot assembly during glue-up, use strips of painter's tape across the miter joint and from corner to corner.

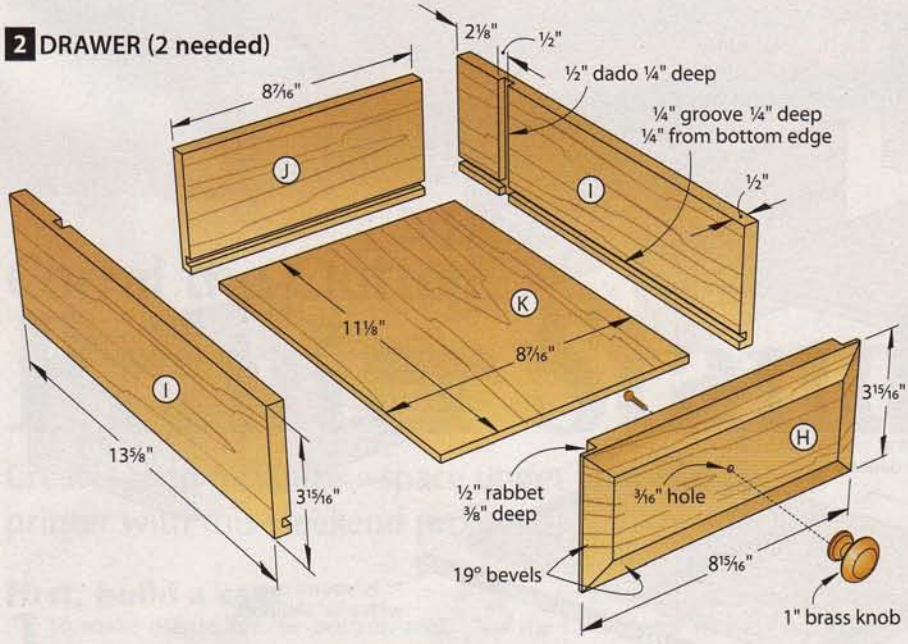


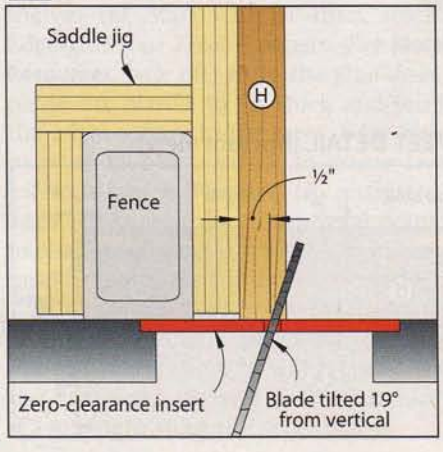
F BEVEL DRAWER FRONTS

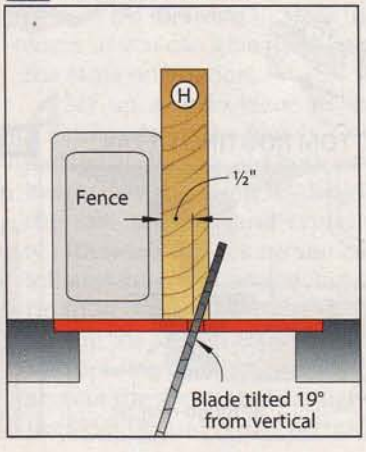
Bevel the ends of the drawer fronts first. Any tear-out where the blade exits the cut will be cleaned up when beveling the edges.

8 Finish-sand the case pieces (A–E) to 220 grit. Glue the carcase together [**Photo D**], making sure the case sides (B) and center partition (C) are tight against the back of the trim (D) and that the shelves (E) are flush with the front edges of the case sides (B) and center partition. Check that the assembly is square.

9 Measure between the rabbets in the back of the case and cut the back (F) to fit in the recess. Set the back aside for the time being.







Now form the feet

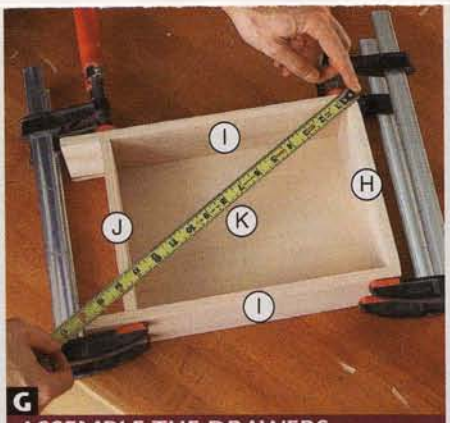
1 From ½"-thick stock, crosscut two 4"-long blanks for the back feet (G) [**Drawing 1**]. Then miter-cut two pairs of 4"-long blanks for the front feet (G). Next, make three copies each of the **Left** and **Right Foot Patterns** from the *WOOD Patterns®* insert and attach one to each blank with spray adhesive. Cut the feet to shape on a scrollsaw or bandsaw, and sand the edges smooth. ***Quick Tip! Cut your time in half.*** Stick two feet together with double-faced tape and cut the profile in both at one time.

2 Glue the four mitered feet (G) into two pairs [**Photo E**]. When the glue has dried, finish-sand the feet to 220 grit. To attach the front foot assemblies to the case, apply glue along the full length of the front foot, but only to the front 2" of the perpendicular foot [**Drawing 1b**]. Then clamp the front feet to the case. On the back feet, apply glue only to the rearmost 2", and then clamp them in place.

Build a pair of drawers

1 Measure the height and width of the drawer openings and cut two drawer fronts (H) from ¾"-thick stock to 1⁄16" less than these dimensions.

2 Tilt your tablesaw blade to 19° and install a zero-clearance insert around the blade [**More Resources**]. With a saddle jig (see *page 70*) straddling the rip fence, set the fence as shown in **Drawing 2a**. Now bevel the ends of both drawer fronts (H) [**Photo F**]. Set the saddle jig aside, reset the rip fence [**Drawing 2b**], and bevel the top and bottom edges of each drawer front.



G
ASSEMBLE THE DRAWERS

Clamp across the front and back of the drawer. Identical diagonal measurements mean the drawer is square.

3 Center a hole on each drawer front to accept the screw for the knob [**Drawing 2**]. Then cut the ½" rabbets to accept the drawer sides.

4 Cut the drawer sides (I) and drawer backs (J) to size [**Materials List**]. Machine grooves the thickness of the drawer bottoms (K) [**Drawing 2**]. Then cut dadoes across the drawer sides to accept the drawer backs. Cut the drawer bottoms to finished size and glue up the drawers [**Photo G**].

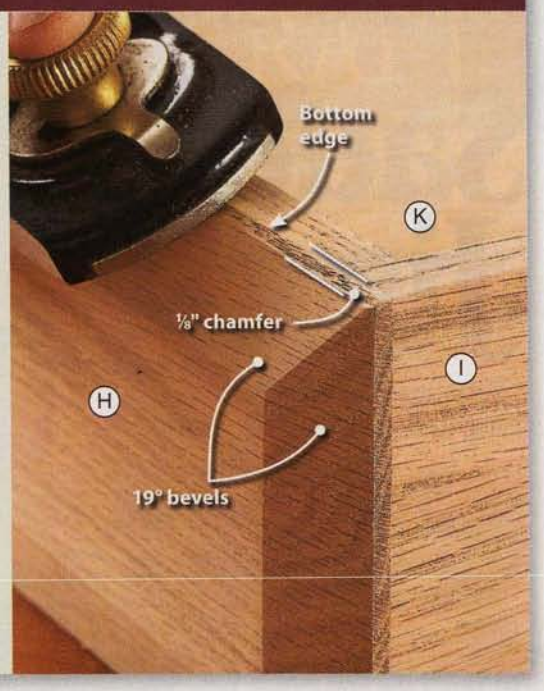
5 Create a chamfer along the bottom edge of each drawer, as explained in the **Shop Tip** at *right*.

SHOP TIP

Create the illusion of a gap

Instead of being suspended on drawer slides or guides, these drawers simply slide along the bottom of the case. You'll have a gap above and along each side of the drawer, but not below it. So you have to create the appearance of one.

That's easy to do by simply sanding or planing a slight chamfer along the bottom edge of the drawer, as shown at *right*. Take a few light passes; then slide the drawer into the case. If the "gap" looks equal on all four sides of the drawer front, you're done. If not, keep removing material with light passes until the gaps look balanced.



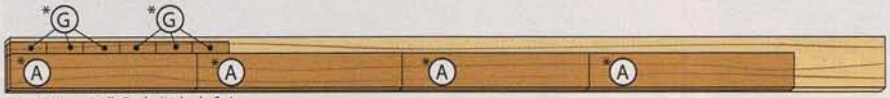
Finish it up

1 Finish-sand all pieces to 220 grit; then apply the finish. (We used Red Chestnut stain from Varathane, and then applied two coats of a semigloss polyacrylic from Minwax, sanding with 320-grit sandpaper between coats.)

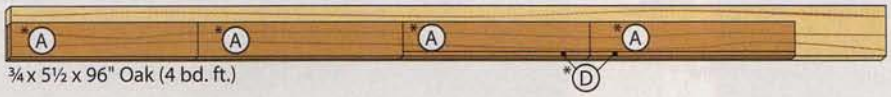
2 Attach the brass knobs [**Drawing 2**]. Then fasten the back (F) to the carcase with #17×1" brads.

Written by **Craig Ruegsegger** with **Kevin Boyle**
Project design: **Jeff Mertz**
Illustrations: **Roxanne LeMoine; Lorna Johnson**

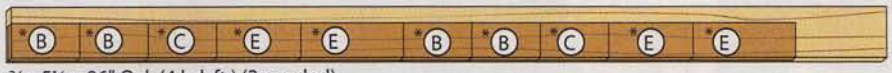
Cutting Diagram



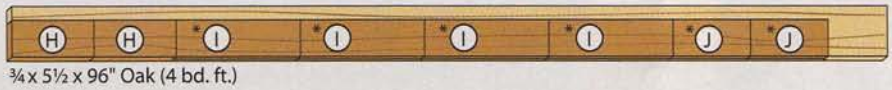
¾ x 5½ x 96" Oak (4 bd. ft.)
*Plane or resaw to the thickness listed in the Materials List.



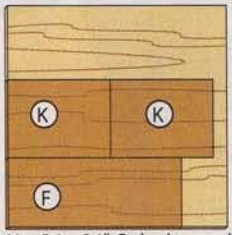
¾ x 5½ x 96" Oak (4 bd. ft.)



¾ x 5½ x 96" Oak (4 bd. ft.) (2 needed)



¾ x 5½ x 96" Oak (4 bd. ft.)



¼ x 24 x 24" Oak plywood

Materials List

		FINISHED SIZE T	W	L	Matl.	Qty.
Case						
A*	bottom/top	½"	14"	20½"	EO	2
B*	sides	½"	14"	7½"	EO	2
C*	center partition	½"	13¾"	7½"	EO	1
D*	bottom/top trim	½"	½"	20½"	O	2
E*	shelves	½"	13¾"	9¼"	EO	2
F	back	¼"	7½"	19"	OP	1
G	feet	½"	1¼"	4"	O	6
Drawers						
H	fronts	¾"	3 15/16"	8 15/16"	O	2
I	sides	½"	3 15/16"	13⅝"	O	4
J	backs	½"	3 15/16"	8 7/16"	O	2
K	bottoms	¼"	8 7/16"	11⅛"	OP	2

*Parts initially cut oversize. See the instructions.

Materials key: EO–edge-glued oak, O–oak, OP–oak plywood.
Supplies: Spray adhesive, #17x1" wire brads.
Blade and bits: Stack dado set; ¼" cove, ⅜" roundover, and ¼" straight router bits.

Source

Knobs: 1" brass knobs (2) no. 36467, $4.69, Rockler, 800-279-4441, rockler.com.

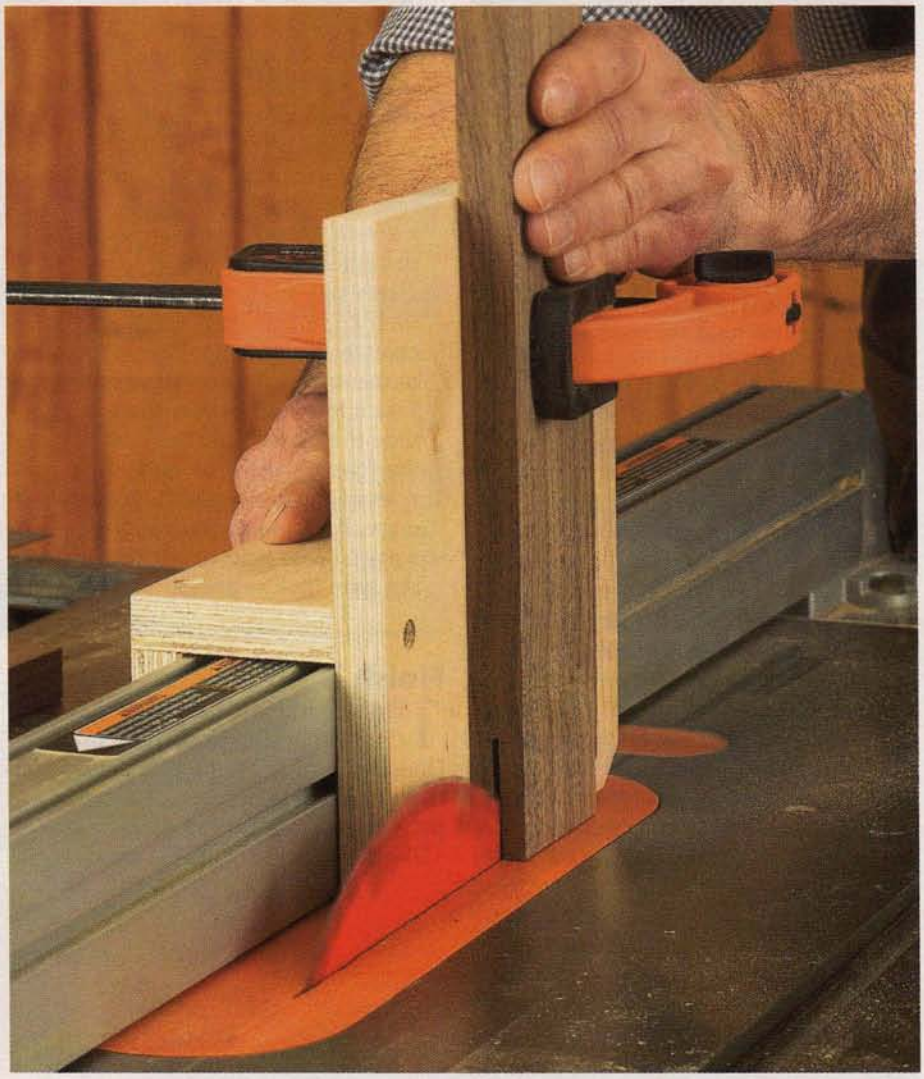
MORE RESOURCES

FREE VIDEOS

- "Zero-Clearance Insert" at woodmagazine.com/zcivideo
- "Gluing Up Flat Panels" at woodmagazine.com/panels

Saddle Jig

Not just a one-trick pony, this fence saddle rides to your rescue when balancing tall pieces on the tablesaw.



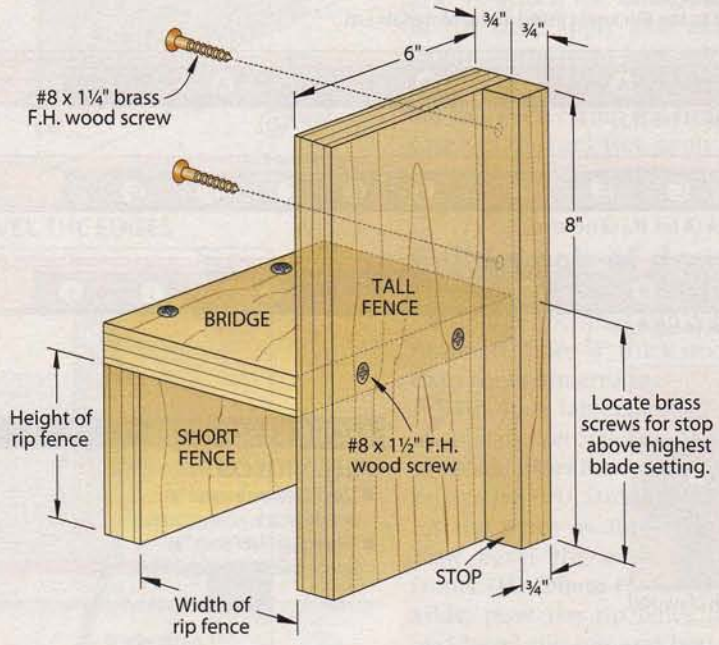
Running a tall workpiece against the rip fence of a tablesaw can be an awkward and dangerous operation. The piece wants to tip in just about every direction. This sliding saddle jig solves that problem.

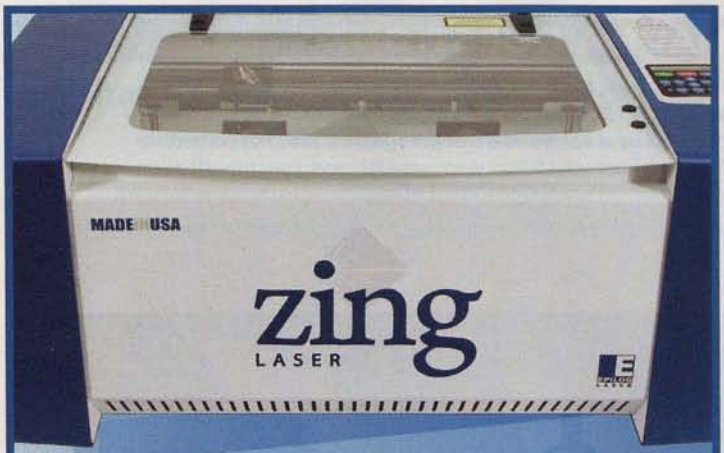
A workpiece clamped to the jig against the stop can't shift as it moves past the blade. The tall fence and stop steady lanky workpieces for end-grain cuts, such as when beveling the ends of the drawer fronts for the printer stand on *page 66*, or when cutting tenons and open mortises for bridle joints, as shown in the photo at *right*. As a bonus, the stop backs up the workpiece to reduce chip-out.

Build the jig to fit the width and height of your saw's rip fence. When measuring the height, make sure you take into account any bolt heads that may extend above the top surface of the fence.

Assemble the stop, tall fence, and bridge first. (Use brass screws, not glue, on the stop so you can replace it as it gets chewed up.) Before screwing the short fence to the bridge, put a playing card between the short fence and the rip fence to ensure a smooth-sliding fit.

When using the jig, the workpiece should be clamped in place, as shown in the photo. Guide the jig with both hands, pressing down to the table and against the blade side of the rip fence. By gripping the workpiece at the top of the tall fence, your hand stays well out of the path of the blade.





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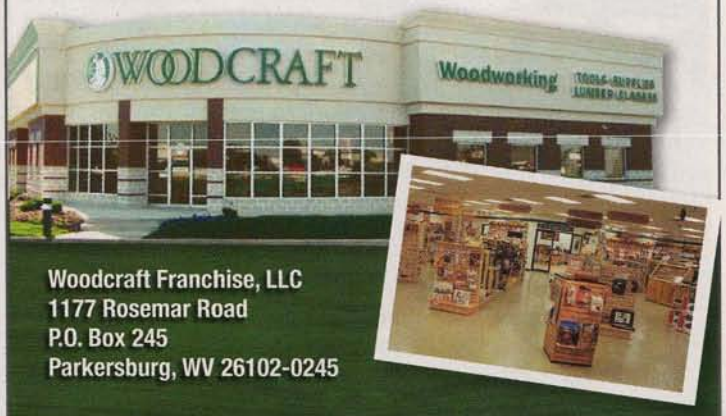

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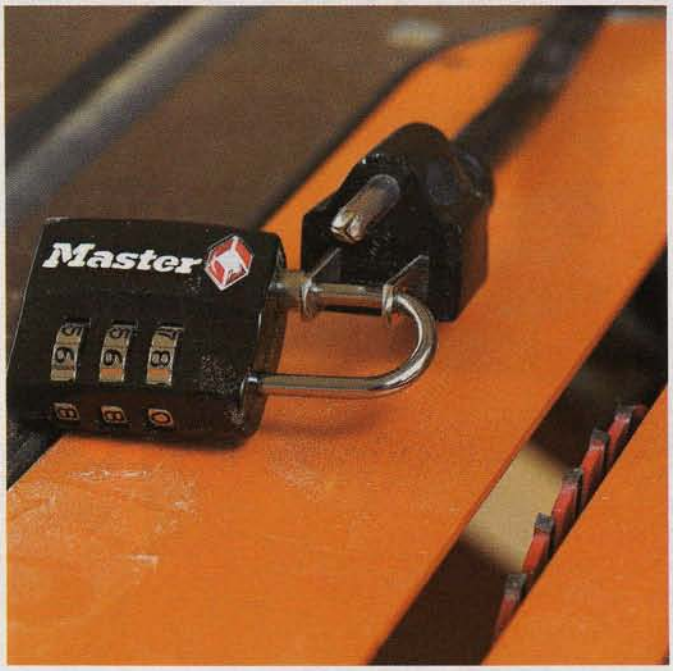
Safety-fying the shop

Q: I'm leaving on a trip and I'm worried that my kids might hurt themselves playing in the shop. Could you give me some suggestions for quickly securing my garage shop?

Pat Smith, Surry, Va.



A: Here are a few tips for child-proofing your shop, Pat. First, clean up. Put away all portable power tools that can be stored and tidy up the floor to remove any tripping hazards. Next, unplug all power tools and secure the plugs. The simplest way to do this is with small, inexpensive luggage locks through the plug, shown *right*. Finally, remove all blades, bits, and knives from tools and store them in locked cabinets.

And have a quick talk reminding your family to use caution in the garage. When you return from your trip, follow through with a more thorough shop safety education. Who knows? What starts as a lecture in woodworking safety might become a family hobby.

The straight scoop on wood grain

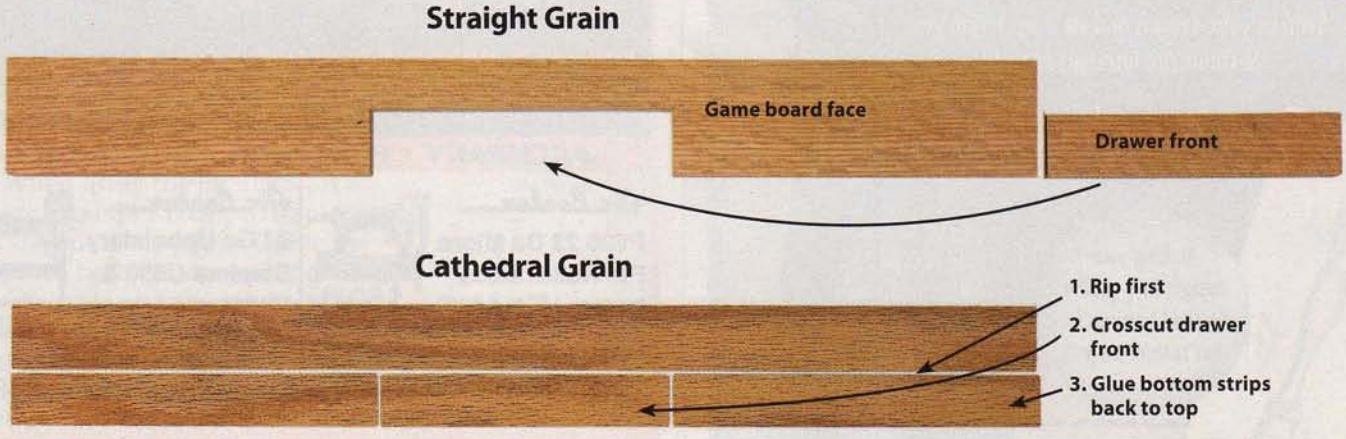
Q: Your plans for the Chinese Checker Board in the October 2008 issue (no. 186) say to bandsaw the drawer opening out of the front, but you obviously didn't do it that way because the grain pattern of the drawer matches. Tell us what you really did.

—George Long, San Francisco

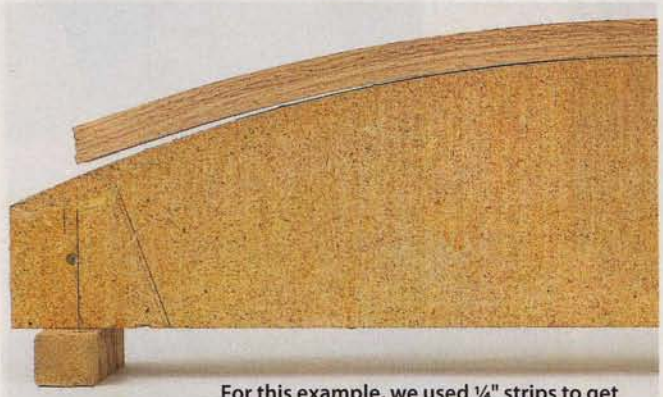
A: George, your critique is actually a compliment to our builders' ability to choose grain in projects. In this case, we cut the drawer front from the end of the board directly adjacent to the game board face, as shown *below*.

Good grain selection begins at your hardwood dealer. Take your cutlist along when you choose your stock, but rather than simply choosing boards to use as little stock as possible, select boards with an eye toward compatible grain patterns and matching wood tones. In the case of the Chinese Checker board drawer front, straight-grained oak made the task of aligning the grain easier.

If you prefer cathedral grain and still want it to match, cut the drawer front from the game board face, as shown *bottom*, at your tablesaw and glue the three front parts back together. Be sure to account for the blade kerf when sizing the game board face blank.



What to do when springback springs



For this example, we used ¼" strips to get significant springback. Where the shape of curves is critical, use ⅛" or thinner strips.

Q: The glue-ups for the curved arms on my Morris chair seemed to go well, but when I took them out of the forms, there was springback. I used Titebond III and ⅛"-thick strips of quartersawn white oak. Should I be doing something differently?

—Peter Bradshaw, Doral, Fla.

A: You could try epoxies and plastic resin glues that are stiffer than typical wood glues, Peter. But like you, we reach for plain, yellow glue for our cold-bent laminations because it's cheap, easy-to-use, and readily available.

You're also on track with the ⅛"-thick strips. Just take a cue from your glue-up and relax a little. Don't sweat some springback in your Morris chair arms, which will be firmly screwed in place. When you can't count on fasteners to pull the part to the correct curve, create your bent laminations first. Then, springback or no, build the rest of the project around the resulting curve.

After gluing up any curved parts in a project, mark and cut adjacent parts to match.

continued on page 74

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Solid wood: What's in a name?

Q: I've heard several manufacturers tout their products as solid wood, but they sometimes use plywood panels for the case back. Can solid wood furniture contain plywood?

—Lynne J. Archibald, DeKalb, Ill.

A: Since the Federal Trade Commission stopped regulating furniture labeling in 2000, Lynne, terms found on those labels (such as "all wood," "wood products," and "engineered wood") make it difficult for consumers to know exactly what they're buying.

Jaclyn Hirschhaut, spokeswoman for the American Home Furnishings Alliance helped us sort it out. She tells us that the term "solid wood" only applies to furniture or cabinets constructed of solid wood. Add a veneered surface or engineered woods, such as plywood or MDF, and the designation changes to "solid wood with veneers" or "all wood" construction.

Despite the negative connotation it has picked up from mass-produced knockdown furniture, plywood shouldn't be a dirty word in the furniture business or in your own projects. It is strong, stable and offers consistent color. Used properly, it can make an heirloom piece last even longer.

Choked up over smoke smell

Q: We bought a hardwood bed from the classifieds, but didn't realize that it had been in a smoker's house. When it arrived home, the cigarette smell filled the room. How do we get rid of the stink?

—Ryan Johnson, Ankeny, Iowa

A: Ryan, we posed your question to Scott Cierzan, president of First Call Construction of Ankeny, Iowa, specialists in fire and smoke damage repair. "For hard surfaces," he says, "you'd be surprised what a thorough surface cleaning will do." Scott's advice: Completely wipe down the surface with water and a gentle soap, such as Murphy's Oil Soap. Then dry thoroughly with cloth or paper towels.

If the smell persists after the surface cleaning, it means the smoke molecules have sunk into the pores of the wood. Oxidizing those molecules reduces them to odorless compounds. Scott's company uses an ozone generator, but for a home remedy, some quality time in the garage with a fan will suffice.

As a last resort, if a trace of smell remains, you can try sealing it into the furniture by adding a couple coats of clear finish. This traps the smell where the molecules will break down and dissipate undetected.

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New Unisaw makes the cut in our shop

It's not often an industry icon gets a complete makeover, but that's what Delta did with its new version of the Unisaw cabinet-style tablesaw. The result: a greatly improved machine. With changes both cosmetic and functional, Delta is banking that woodworkers—professional and hobbyist—will pay a premium for a saw assembled in Jackson, Tenn., of primarily U.S.-made components.

This Unisaw has a massive one-piece cast-iron trunnion that virtually eliminates alignment woes and vibration by ridding the saw of some of the moving parts of the old assembly. On the front of the saw you'll find both the blade-height and bevel-angle handwheels, a large, easy-to-read bevel gauge with half-degree markings, and bevel-stop adjustments.

The Unisaw's quick-release blade guard system, which includes a three-position riving knife, anti-kickback pawls, and two-piece guard, is the best I've tested. Why? Because Delta engineers put the release lever outside the cabinet under the fence rail, as shown *below*, so you can remove or adjust the riving knife without removing the throat plate and without tools.

They also made changing blades easier, thanks to a 5"-wide throat opening (my knuckles thank you, Delta engineers), easy-to-reach arbor lock, large angled wrench, and one-piece arbor nut and washer. I installed a ¾" dado stack on the arbor and still got the nut tightened fully. Delta also includes a nut without the washer, which I used for dado setups up to 1" wide.

And I have to give Delta credit for its factory-supplied, 50-tooth, 10" combination blade, shown *below*. It cuts well in all materials without burning or tear-out, although it ever so slightly scores edge- and end-grain.

More findings from our testing of a 3-hp model:

■ **Rip fence.** Delta now ships a Biesemeyer T-square rip fence with each Unisaw, and it features an improved handle and lock. Dialing in the right combination of firm lock and easy sideways travel while still keeping it square to the blade proved fussy during setup, but once there it's like a rock.

■ **Miter gauge.** The included miter gauge is a step up from what comes with most tablesaws these days, featuring an 18½" bar with T-slot washer, a soft-grip handle, and nine adjustable angle detents. But the pointer sits too far back from the scale to rely on it for dead-on precision with non-detent angles.

■ **Dust control.** Although the new machine has dust-collection improvements, it's not perfect. It requires at least a 1½-hp unit to maintain airflow necessary to evacuate dust. The saw has a 5" dust port, and comes with a 4" reducer. As you might expect, it cleared dust better using the 5" hose.

■ **Zero-clearance help.** This is minor, but I appreciate that the blade drops fully below the bottom of the throat plate, so I didn't have to make any relief cuts prior to cutting the kerf in a shop-made zero-clearance insert. I wish all tablesaws had this feature.

—Tested by Bob Hunter, Tools and Techniques Editor, and the rest of the WOOD® *magazine staff*

Delta Unisaw 10" tablesaw

Performance		★★★★★
Price	#36-L336 (3 hp, 36" rip cap.)	$2,875
	#36-L352 (3 hp, 52" rip cap.)	$3,000
	#36-L552 (5 hp, 52" rip cap.)	$3,200

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800-223-7278; deltaportercable.com

Clean dusty air rather than breathing it

Not having used an air-filtration system in my basement shop before, I was amazed at how much dust Powermatic's PM1200 collected on its outer filter after only 10 hours of normal shop use. That jolted me to be more conscious of the air I was breathing.

To challenge the PM1200, I wore a respirator and blasted everything in my shop with jets of compressed-air, stirring up a smog-quality haze. I set the cleaner on its highest of three speeds (nearly 1,200 cfm) and left for an hour. When I returned the air looked crystal clear again, and very little dust had settled onto my tools. Rated to trap as much as 85 percent of 1-micron-sized dust particles, this air cleaner makes me confident I can breathe easier in my shop. The remote-controlled PM1200 has a built-in timer that you set for up to nine hours.

—Tested by Bob Wilson, Techniques Editor

Air Filtration System, #PM1200

Performance	★★★★★
Price	$470

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800-274-6848; powermatic.com

Finish two sides without the wait

Unless I'm applying a fast-dry finish like lacquer, things come to a grinding halt when I have to wait for one side of a project to dry before coating the other. For slower-drying finishes, such as polyurethane, Painter's Pyramids allow me to apply finish (or paint) on the less-seen side first, wait a couple of minutes, and then simply flip it over and do the "good" side while the first is still wet. These handy plastic gizmos leave only a pinhole-sized dimple that's easy to rub out. They're surprisingly stout for their size and don't tip over when I place something on them. When not being used they nest neatly out of the way.

—Tested by Kevin Boyle, Senior Design Editor

Painter's Pyramids

Performance		★★★★★
Price	10-pack	$7
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continued on page 78

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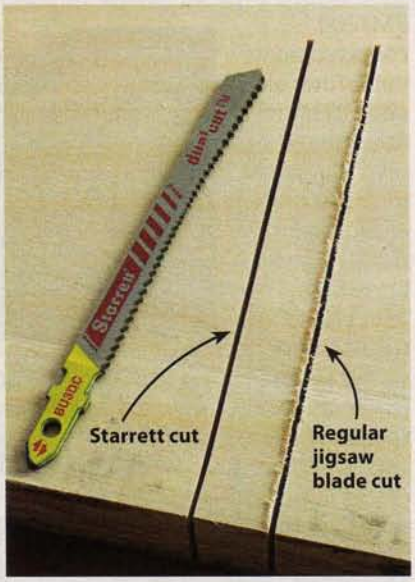


Jigsaws get little respect from woodworkers because bandsaws typically make the same cuts faster and cleaner. To help with the cleanliness issue, the teeth on Starrett's Dual Cut Jigsaw Blades point in opposing directions, so the top teeth cut the top surface on the downstroke and bottom teeth cut the bottom surface on the upstroke—eliminating tear-out on stock thicker than 5/16". I compared them head-to-head with the best jigsaw blades I could find, and the Starrett blades cleaned up in red oak, pine, Baltic birch plywood, and even finicky melamine-coated particleboard.

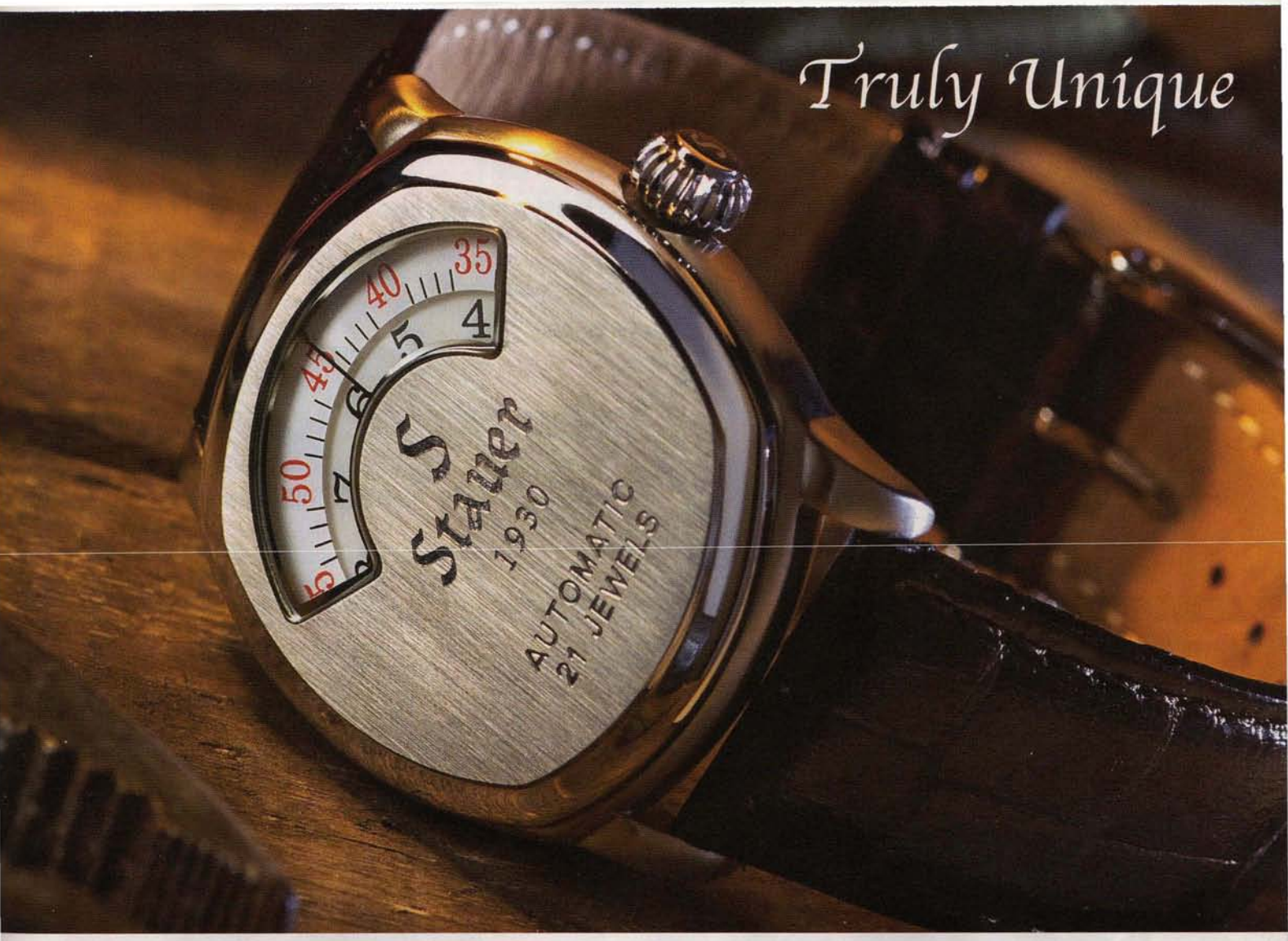
Dual-Cut blades come in two-packs, with the standard blades (BU3DC) designed for cutting stock from 1/4" to 1 3/16" thick, and the scrollcutting blades (BU2DCS) for cutting 5/32" to 3/4" thick. They cost about $1 more per blade, but they're worth it when you must have flawless cuts.

—Tested by Doug Hicks, a former shop teacher and woodworking magazine editor

Dual Cut Jigsaw Blades

Performance		★★★★★
Price	BU3DC	$6
	BU2DCS	$5.50

L.S. Starrett Co.
978-249-3551; starrett.com



Time travel at the speed of a 1935 Speedster?

The 1930s brought unprecedented innovation in machine-age technology and materials. Industrial designers from the auto industry translated the principles of aerodynamics and streamlining into everyday objects like radios and toasters. It was also a decade when an unequaled variety of watch cases and movements came into being. In lieu of hands to tell time, one such complication, called a jumping mechanism, utilized numerals on a disc viewed through a window. With its striking resemblance to the dashboard gauges and radio dials of the decade, the jump hour watch was indeed "in tune" with the times!

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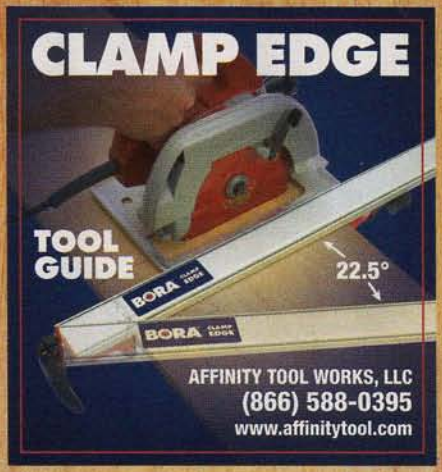

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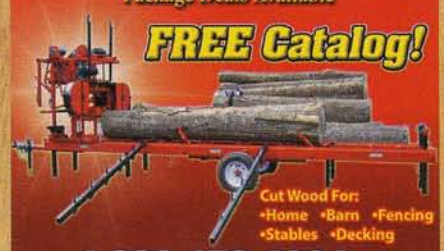

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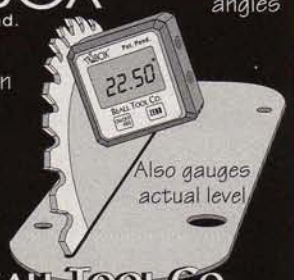

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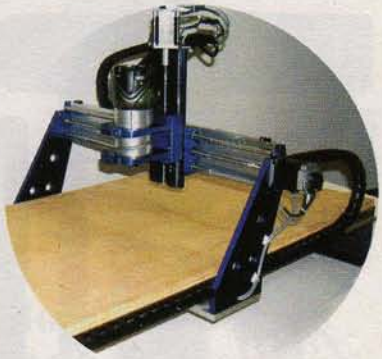

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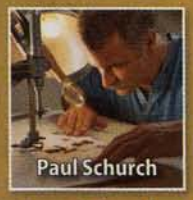
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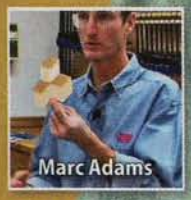
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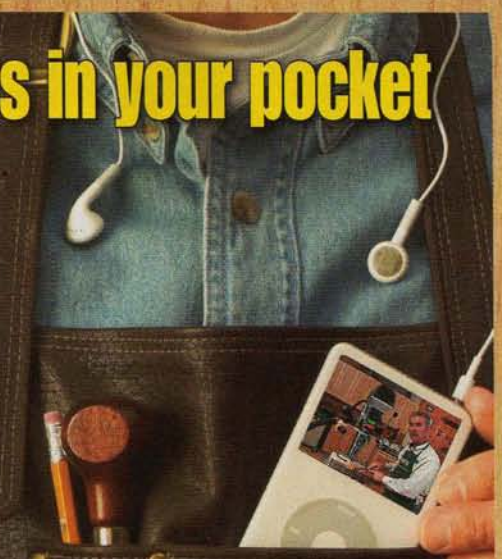

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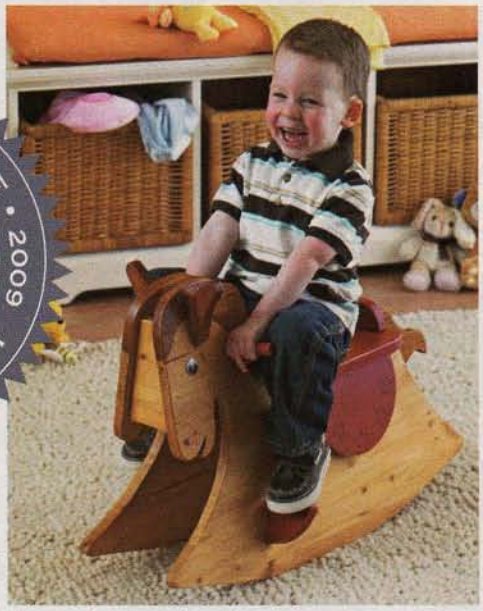
What's Ahead

October 2009: Our special 25th anniversary issue (on sale August 25)

COVER ARTICLE

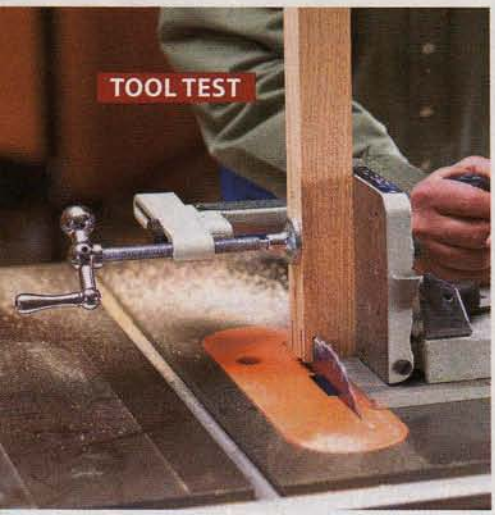
Drop-front Desk
Perfectly sized for a nook and a notebook computer, this desk fits any room. The door lays flat for a writing and work surface, and then folds up to hide what's inside. We'll show you how to easily veneer panels using tools you already own.



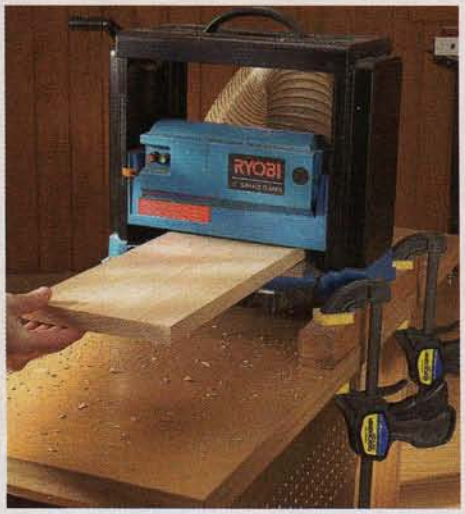
Super-simple rocking horse
Full-size patterns and fast, screw-together assembly help you get this pony into the homestretch quicker than you can say "giddyup."

Build and install door and window trim
Put your shop to work beautifying the rest of your home. Learn the secrets to making your own custom moldings; then discover a pro's advice for mounting them.

TOOL TEST



Tablesaw tenoning jigs
Faster and cleaner-cutting than a dado set, these accessories make tight-fitting tenons in a snap. Learn which ones work best.



25 top innovations of the past 25 years
Prior to 1984, there were no benchtop planers or one-handed bar clamps. We salute those and 23 more tools and products that have greatly improved woodworking.

Salvage old lumber and save
There's cheap lumber all around—if you know where to look. We show you how to locate it, and methods for converting recycled wood into project-ready stock.

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